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CONTENTS

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Original Articles

PRESIDENT'S ADDRESS

NEW YORK SOCIETY OF ORTHODONTISTS

WILLIAM C. KELLER, D.M.D., F.A.C.D., NEW YORK, N. Y.

MEMBERS of the New York Society of Orthodontists: I have had the pleasure of serving you in some official capacity for about nine years. I find myself about to end my service by addressing you as your President—one of the greatest privileges of my entire life, and for which honor I again thank you. As a retiring officer I am required to give an accounting of my year as President, and also make suggestions that may be of help to the Society for its future welfare.

During the year last past, the war has drawn many of our members into the Service. This has not prevented our Society from holding regular meetings and keeping up the quality of papers which have been read on these occasions. Not all other societies have been able to do this. We, as a sectional society, therefore, have been useful as a dependable source of enlightenment not only for the rural practitioner but also for our members who either do not or cannot attend national society meetings. Altogether, it may be said that those of us who have stayed at home, while we may not have gone far forward, neither have we been standing still, for we have helped keep our orthodontic skeleton intact. That, in these days, may in itself be worthy of note.

Some of the suggestions I am about to make may seem a little fanciful during these chaotic times. There is an old saying, "In time of Peace prepare for War." If such a saying is true, why should not the reverse be just as true, "In time of War prepare for Peace"? Because of the war many general practitioners of dentistry and many orthodontists have been called into service. As a result, less and less is heard by the public of the desirability of orthodontic

Delivered at the Annual Meeting, March 6, 1944.

treatment for the child of today. Some time ago our Society and the American Association of Orthodontists promoted a popular educational campaign. Our Society still has a Committee on Public Information, but because of the failure to vote funds, this Committee is facing a slow death. I would suggest that this Committee receive a transfusion of blood plasma, in other words, money, so that due consideration may be given this important activity.

I have just mentioned that many dentists and orthodontists have been called to their country's colors. Every orthodontist who has gone has been proud to serve his country as a dentist, and let me repeat that as *dentists* they have been doing their duty. In this war it has been shown that orthodontics has not been properly considered with a full realization of its benefits. I recommend that efforts that orthodontists have made in treating war injuries be recorded and emphasized so that we may be considered as an essential part of our national martial setup.

If orthodontics is not to break down, we must get a larger percentage of potentially able human beings out of the ranks and train them to take on responsibilities in this field, thus making them useful to society. What we need is for orthodontists to keep their sights high, to aim at a great goal—the goal of full orthodontic development—not for their own advantage alone, but for that of the community which needs them. I know of no better place for this training than at the graduate departments of orthodontics at the recognized universities. To show that our Society is in accord with this belief, I would suggest that we offer each year a prize of a substantial sum of money for an original thesis—this, to be offered to the students at universities located within the confines of our district, and to be conducted in a way similar to those offered by the American Association of Orthodontists.

Our Society is one which was founded principally for the exclusive practitioner of orthodontics. Our development, objectives, and accomplishments have received favorable recognition. That we have been accepted as a society of specialists is proved by the fact that we have been recognized by the Federal Government, organized medicine, organized dentistry, and the general public, principally because we have maintained our standards of requirements and admissions. While membership in our Society carries with it considerable weight, it does not necessarily make the holder an orthodontist, but it does prove that the holder of such membership has certain qualifications. If one does not have the qualifications we require, avenues and opportunities are, now, and have been open to him to acquire proper training in the necessary fundamentals. Unjust criticism has been directed against us because we maintain a high standard. To me it would be a disservice to the public and to the profession to lower our requirements to appease a small minority, regardless of the influence brought to bear. My suggestion is that we do not change our constitution and bylaws to lower our standards of admission. Those who are interested in our specialty that do not have the qualifications for membership have always been welcome at our meetings, and will continue to have this privilege.

Of late there seems to exist considerable confusion because of the changing trend of thought on treatment. Suggested changes from simple pressure appliances to controlled action with a definite objective seem to have caused,

in many instances, some misunderstanding. Criticism of methods of treatment is most helpful. Any science must advance; it cannot stand still and exist. We may smile at procedures and methods used twenty-five years ago, but should we fail to listen to suggestions offered now, and ridicule them without giving them a fair trial, those who follow in our footsteps will laugh at us for hindering the advance of progress. Orthodontics must continue to be a growing process of ideals and theory checked by scientific facts.

With this in mind I have made an effort during my administration to bring about a clarification of the existing state of confusion by bringing before you essayists on the several popular techniques of treatment, so that we might now direct our thoughts, at the junction at which we find ourselves, to a more unified but still individual concept of the state of the treated denture. This has been done by encouraging the return to the old presentation of an open forum, with open and also formal discussions. So much benefit can be achieved by such procedures that I suggest the continuation of this type of meeting.

I have just mentioned the confusion of thought existing because of the various techniques in treatment. It comes to my mind that some of this may be due to the lack of proper terms to express our concepts or perhaps the wrong interpretation of these terms. Perhaps a committee on nomenclature to act with the similar body of the American Association of Orthodontists is desirable. If so, such a committee should be appointed.

In closing, allow me to express my appreciation for the splendid cooperation of the officers and committees of the Society. I should like especially to commend the Executive Committee, Drs. Lowy, Callaway, and Donald Waugh; and the Advisory Committee, Drs. Ross, Erikson, and Glaser. The Secretary, Dr. Hillyer, and our Executive Secretary, Mrs. Grimm, have also been most cooperative at all times.

THE FORMATION OF CEMENTUM

WILLIAM LEFKOWITZ, D.D.S.*

CEMENTUM may be defined as a bony covering of the roots of the teeth. It consists of a matrix composed of calcified collagenous fibrils and may be either cell-free or contain cement corpuscles, sometimes called cementocytes. The first formed layer is acellular or hyaline cementum. Subsequently formed layers may be either cellular or acellular. Generally, the imprisoned cells are found in the apical area and in the bifurcation of multirooted teeth. The cementum also contains imbedded fibers of the periodontal membrane.

At the surface of cementum there is an uncalcified layer called precementum. It may be observed in histologic sections between the cementoblasts and calcified cementum. It stains pink with eosin, demonstrating its lack of calcification. A similar uncalcified layer, predentine, may be observed between the odontoblasts and calcified dentine.

Cementum and bone are similar in appearance. The basic difference is that cementum is deposited throughout life, whereas bone is constantly being resorbed and replaced. Furthermore, there is no inclusion of blood vessels in cementum as is common in bone. The bone changes result in very little alteration of substance. Because of the continuous deposition of cementum there is a constant increase of this tissue with age.

The primary function of cementum is to provide a means of attachment of the principal fibers of the periodontal membrane to the root. It further serves to repair resorbed areas of the root. It is associated with active eruption by continuous deposition.

The importance of cementum has long been recognized. Studies in comparative anatomy, old and young teeth of human beings, have contributed much to our present knowledge of cementum.[1] Recently, as a result of Gottlieb's investigations, the phrase "biology of the cementum" became prominent in the literature.[2] From his findings, one may conclude that the cementum possesses vitality. These physiologic studies have proved a valuable aid to understanding normal as well as pathologic cementum.

The cementum is a product of the periodontal membrane, from which it derives its nourishment. This may be observed by histologic examination of the cementocytes in cellular cementum. In the deeper layers regressive changes of the cementocytes are evident. Irregular staining of the nucleus demonstrates pyknotic changes. Frequently, the nucleus is chromophobic and does not stain at all. In the superficial layers the cementocytes appear normal, indicating an increased vitality toward the surface.

Presented at the Annual Meeting of the New York Society of Orthodontists, New York, March 6, 1944.

*From the Laboratory of Oral Histology, School of Dental and Oral Surgery, Columbia University, New York, N. Y.

The highest stage of vitality of the cementum exists in the uncalcified surface, the precementum. Fig. 1 illustrates the precementum in a section of normal human cementum. The narrow calcium-free layer may be observed at *P* between the calcified cementum *C* and the cementoblasts *CB*. The presence of precementum is evidence of the continuous deposition of cementum. New periodontal fibers are imbedded in it during its formation and subsequently it becomes calcified as a new layer of precementum is formed by the periodontal membrane.

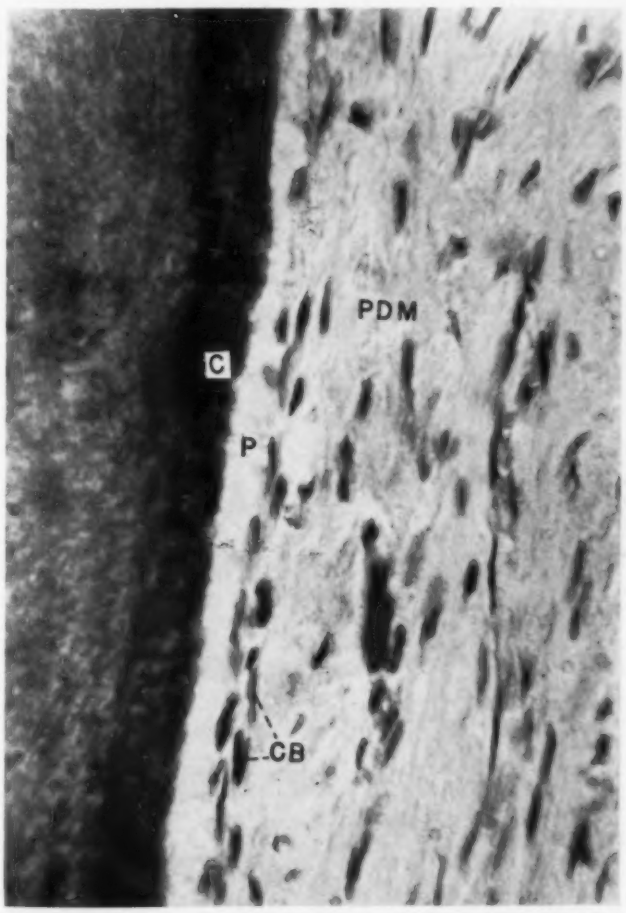

Fig. 1.—Section of normal human cementum. Calcified cementum (*C*); precementum *P*; cementoblasts *CB*; periodontal membrane (*PDM*).

Recently, Gottlieb[3] showed that the apical movement of the epithelial attachment is arrested by the precementum. The epithelium has never been observed attached to precementum. The apical migration of the epithelial attachment along the cementum may be observed in Fig. 2. The epithelial attachment *EA* may be observed attached to the cementum *C*. No precementum is present in the area of the attachment. Immediately apical to the attachment, the transeptal fibers of the periodontal membrane (*TF*) and the precementum *P* may be observed. Skillen and Lundquist[4] reported the apical migration of the epithelial attachment after severing the periodontal membrane from the cementum. It is likely that the precementum was also removed or lost its vitality after severing the periodontal membrane.

There can be little doubt that the deposition or resorption of cementum is a function of the periodontal membrane. The factors that cause this tissue to reverse its normal activity are unknown. Gottlieb's[5] investigations suggest that a calcified tissue bordered by connective tissue may possess properties that either result in apposition or in resorption. He postulates that a calcified tissue may possess two qualities which promote apposition or resorption. The degree or quality of calcification may influence the activity of the adjacent connective tissue. Furthermore, the degree of vitality may influence these

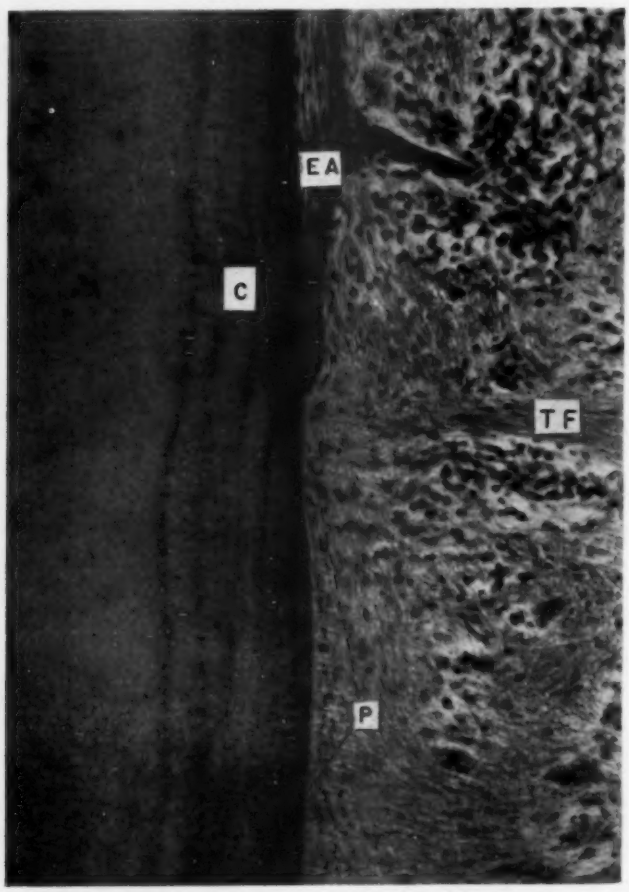

Fig. 2.—Section of cementum in area of epithelial attachment. Epithelial attachment (*EA*) is attached to calcified cementum (*C*). Transeptal fibers (*TF*) at most apical area of epithelial attachment. Precementum (*P*) may be observed extending apically from epithelial attachment.

processes, i.e., a high degree of vitality stimulates apposition while a low degree results in resorption. The character of the cementum surface assumes greater importance in the attempt to understand cementum deposition and resorption. The uncalcified surface possesses a "quality" of calcification. Furthermore, it is the most vital part of cementum. Both of these qualities are presumed to influence the periodontal membrane to either resorb or deposit cementum.

Resorption may be defined as destruction or loss of tissue by reversal of the biochemical processes. Resorption of dentine from the interior is rare. Resorp-

tion of cementum under normal conditions is rare. Since they are both tissues undergoing constant deposition to a varying extent, resorption of either is considered pathological. Predentine is highly resistant to resorption. A classical illustration of the resorption-resistant quality of predentine was described by Mueller and Rony.[6] The precementum probably possesses the same property in resisting resorption. To carry Gottlieb's thesis to its logical conclusion, the quality of calcification which resists resorption should permit deposition. If the precementum resists resorption, it should possess the property to stimulate formation.

Fig. 3.—Section of canine of cat three and a half months after papillectomy. Note bony deposit resembling cementum on inner surface of dentine. Bony deposit (*B*). Resorption (*R*).

Experimentally induced pathology frequently lends itself to a better understanding of biologic activity. In order to study the influence of the odontoblast on early tooth formation, a papillectomy was performed on the teeth of cats. Under ether anesthesia, the dental papillae of the canine teeth of cats were removed through the inferior border of the mandible.[7] The dental papilla was removed with the odontoblasts. The predentine remained attached to the calcified dentine.

Specimens examined three and a half, and seven months after papillectomy showed that the pulp chamber was filled with adult connective tissue and a bony

process of the apical alveolar bone (Figs. 3 and 4). The pulpal surface of the dentine was covered with a bonelike tissue closely resembling cellular or osteocementum. Projections of the bonelike tissue resembling spike formation (*S*) of cementum are evident (Fig. 4). The connective tissue fibers were imbedded in the matrix of the bony covering, similar to the imbedded fibers of the periodontal membrane.

Fig. 4.—Section of canine of cat seven months after papillectomy. Bony deposit (*B*) on predentine. Spike formation (*S*). Resorption (*R*) occurred from without inward. Fracture (*F*).

It is further interesting to note that the inner surface of the dentine was not resorbed with the exception of area *R* in Fig. 3. Because slight resorption of the peripheral tissues is evident, it is likely that area *R* (Fig. 3) is a perforation proceeding from without, inward. Close examination of the inner surface of the dentine shows that the predentine remained attached to the dentine. Fig. 5 is a higher magnification of the predentine, showing dentinal tubules. Calcospherites normally found in predentine may be observed in Fig. 6.

Fig. 7 illustrates three interesting comparisons. The section is closely similar to cementum, periodontal membrane, and bone, with the exception that these tissues formed in the pulp cavity. The bonelike tissue deposited on the predentine (*PD*) closely resembles cementum. Lamellae may be observed at *L*.

Imbedded cells resembling cementocytes or osteocytes are present. A thin uncalcified zone similar to precementum may be seen (*Pc*). The connective tissue (*CT*) between the pseudocementum and bony process (*BP*) has assumed the character of a true periodontal membrane. Bundles of connective tissue fibers with fibroblasts may be observed attaching the cementumlike tissue to the bony process found in the pulp chamber. The section closely resembles a section of cementum, periodontal membrane, and alveolar bone. The resorption

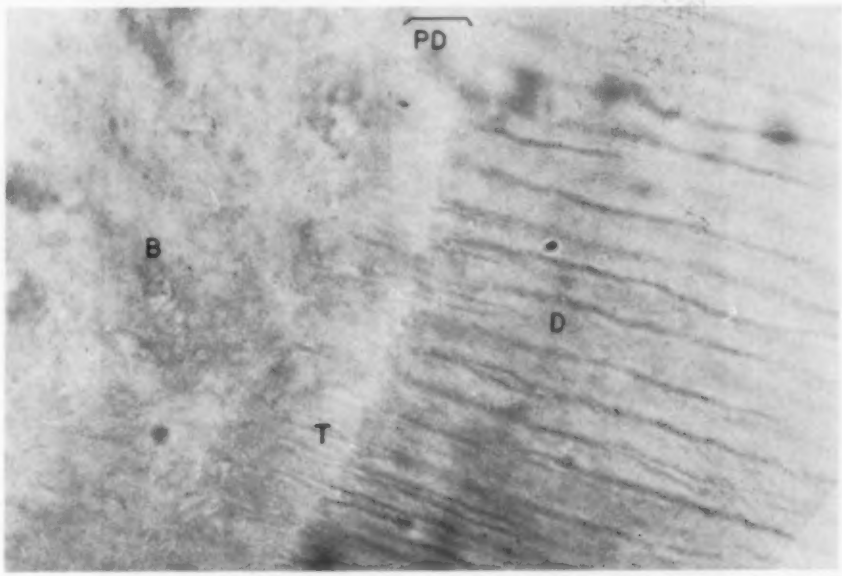

Fig. 5.—High magnification of predentine area of papillectomized tooth. Calcified dentine (*D*); predentine (*PD*); dentinal tubules passing into predentine (*T*); bonelike tissue (*B*); formed on predentine.

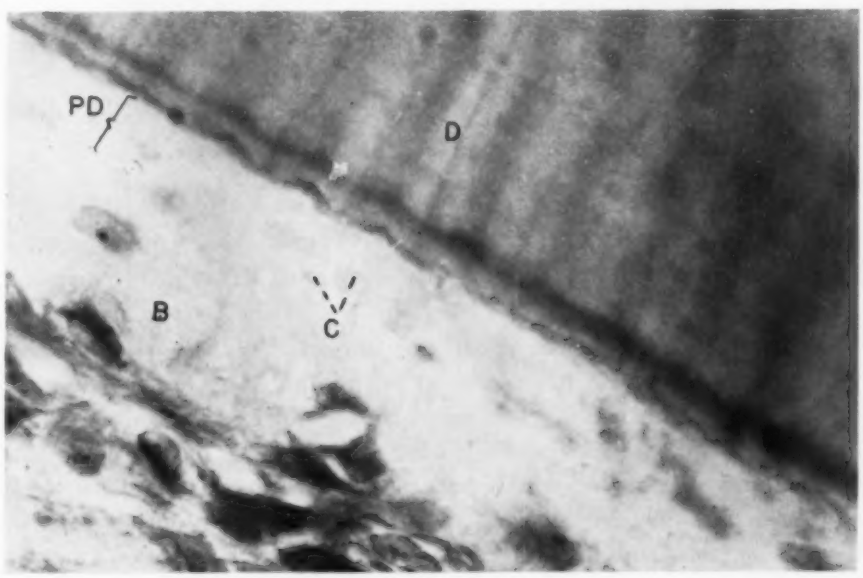

Fig. 6.—High magnification of predentine of papillectomized tooth. Calcified dentine (*D*); predentine (*PD*); calcospherites in predentine (*C*); bonelike tissue (*B*) formed on predentine.

and apposition of the bony process (*B*) and continuous deposition of cementum-like tissue are the result of the continued eruption of the experimental tooth.[8] This may be seen in Fig. 4.

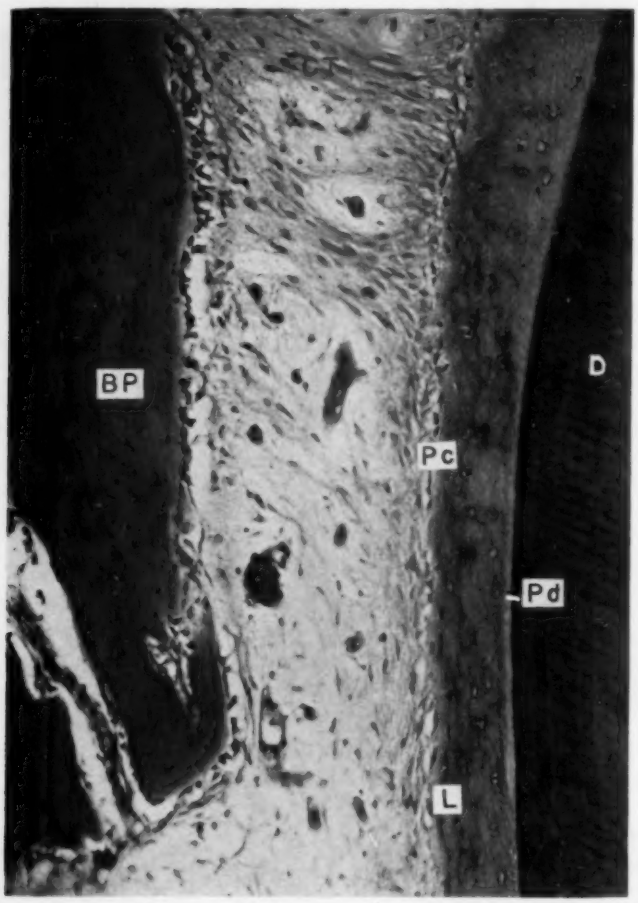

Fig. 7.—Higher magnification of area of Fig. 4. Note resemblance to normal paradentium. Calcified dentine (*D*); predentine (*PD*); bonelike tissue (*BP*), resembling cementum. Uncalcified surface on bonelike tissue resembling precementum (*Pc*). Connective tissue (*CT*) resembles periodontal membrane. Bony process (*BP*) in papillary area.

The deposition of a bony tissue similar to cementum on the calcium-free inner surface of the cementum following experimental papillectomy controverts the Gottlieb theory that vitality of the calcified tissue influences deposition. In comparison to the calcified dentine, the predentine contains the higher degree of vitality. Studies in the vitality of the dentine demonstrate the necessity of an odontoblastic layer with a normal pulp capable of forming dentine. The vitality of the dentine may be measured by the activity of dental lymph which originates in the odontoblast and diffuses outwardly through Tomes' fibrils.[9, 10] In experimental papillectomy, the odontoblasts were removed with the papilla. Tomes' fibrils remained in the dentine. The dentine and predentine deprived of the odontoblasts and its tissue fluid, dental lymph, can no longer be considered vital.

According to Gottlieb, the degree or quality of calcification is an important factor in cementum deposition. The formation of a cementum-like tissue on the

calcium-free predentine strongly suggests that connective tissue deposits calcified tissue on an uncalcified or poorly calcified surface.

It is necessary therefore to re-examine the histogenesis of cementum. After formation of the crown of the tooth, the enamel organ gives rise to Hertwig's sheath.[11] Root dentine formation continues within this tubular epithelial structure. Immediately after formation of the root dentine, Hertwig's sheath breaks up into a netlike structure, so that the surrounding connective tissue makes contact with the newly formed dentine, and thus has an opportunity of laying down cementum.

Weidenreich[12] first observed a difference in the peripheral layer of dentine. He named this first formed layer mantel dentine and believed it formed differently from the remainder which he called circumpulpar dentine. The histologic difference between mantel dentine and circumpulpar dentine is that the peripheral layer exhibits narrower tubules and numerous branches. It has also been observed that protective metamorphosis does not occur in the peripheral area. Another and more significant factor is that mantel dentine is poorly calcified. Thewlis[13, 14] in grenz-ray examination of peripheral dentine observed that it was only slightly more calcified than the predentine.

In the root portion, the poor quality of calcification of the peripheral dentine is more exaggerated than in the crown. The peripheral root dentine containing the granular layer of Tomes is the first formed. It is developed in advance of the cementum. The granular appearance of the peripheral layer of root dentine is due to numerous uncalcified zones which in ground sections appear like many small dark granules. Fig. 8 is a photomicrograph and grenz ray of human root. The granular layer of Tomes (*GLT*) may be observed as a thin layer of granules extending around the periphery of the entire root. The cementum (*C*) has been deposited upon this poorly calcified, first formed layer of dentine. The grenz ray of the same specimen illustrates the quality of calcification of the granular layer of Tomes. It is more radiopaque, thus indicating that it is less calcified than the dentine or cementum.

As Hertwig's sheath breaks up into strands, the connective tissue of the follicular wall makes contact with the poorly calcified peripheral root dentine, the granular layer of Tomes resulting in the normal deposition of cementum. Cementum formed always possesses an uncalcified surface, the precementum.

In experimental papillectomy, a similar relation of tissues was produced. The removal of the dental pulp left the calcium-free predentine on the pulpal surface of the dentine. As a result of the operation, the pulp chamber was filled with a blood clot which was later organized into connective tissue. The tissues present in the pulp chamber are in a relationship similar to that found during normal cementogenesis. The connective tissue in the pulp chamber, coming into contact with the calcium-free predentine, is similar to the follicular wall adjoining the granular layer of Tomes. Connective tissue in contact with the calcium-free predentine results in the formation of a cementum-like layer on the inner surface of the dentine.

The experiment in papillectomy sheds further light on the activity of these cells associated with the formation of the dental calcified connective tissues. The

function of the odontoblast and cementoblast is still debatable. Von Korff,[15] and more recently Orban,[16] have shown that dentine is formed by collagenous fibers which arise from the fibroblasts of the pulp. Kronfeld[17] has shown that cementum is similarly formed from collagenous fibers produced by the fibroblasts of the periodontal membrane. The odontoblast imparts vitality to the dentine and provides the histologic characteristics to the tissue. It permits only the

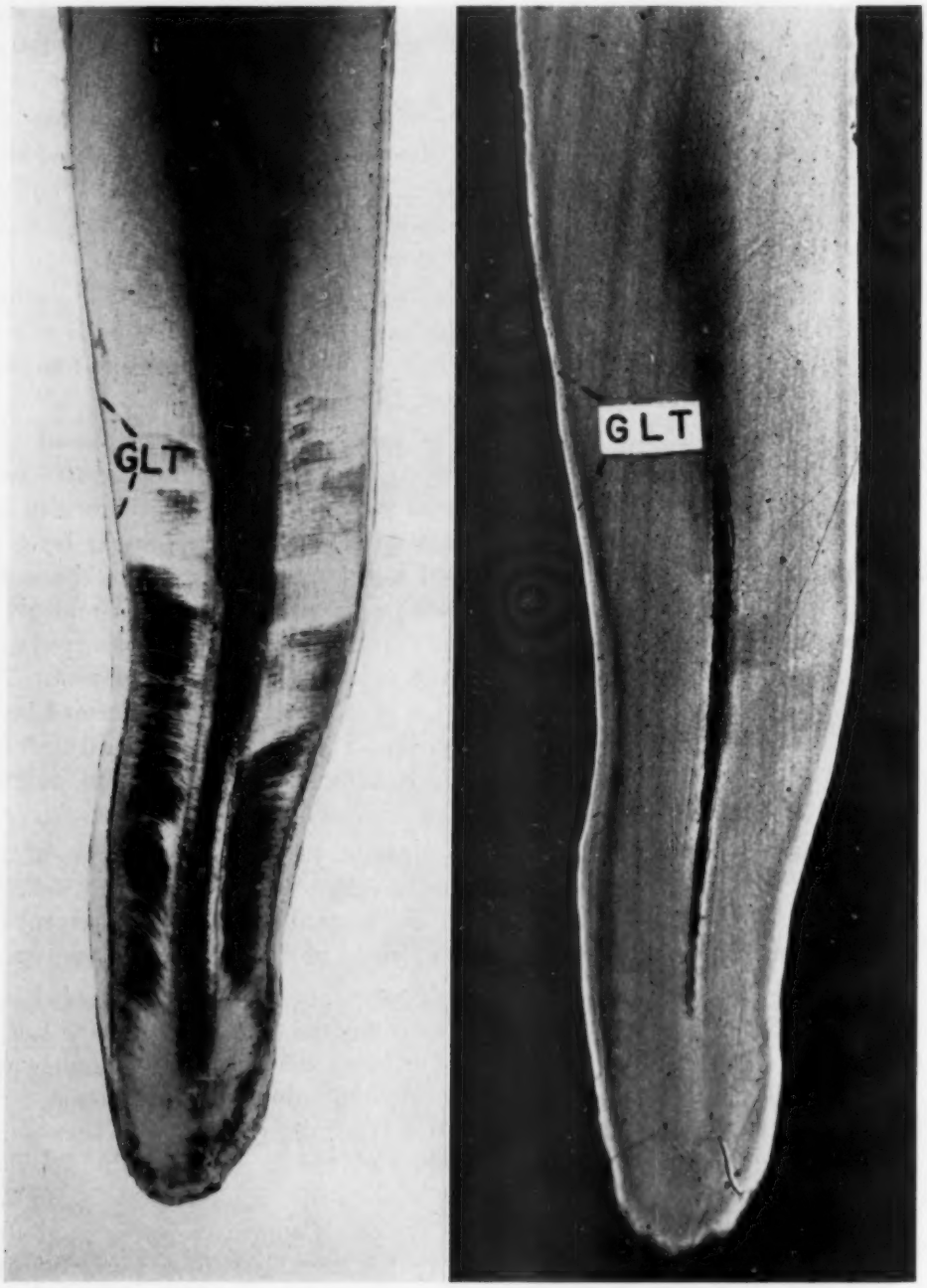

Fig. 8.—Left, Photomicrograph of root of human tooth. Granular layer of Tomes (*GLT*). Right, Grenz ray of same section as to the left. Note hypocalcification of granular layer of Tomes (*GLT*).

formation of dentine, a calcified connective tissue containing tubules for the reception of Tomes' fibrils. In the absence of odontoblasts, the fibroblasts in the pulp may produce a hyaline or bonelike tissue. Wolbach and Howe,[18] in examining the results of avitaminosis C, observed that the odontoblast degenerated and a bonelike tissue formed at the pulpal surface of the dentine. Experiments in papillectomy in which the odontoblasts were removed showed a similar result. In both experiments the significant factors were the absence of odontoblasts and the formation of a bonelike tissue. The cementoblast, also a specialized fibroblast, undoubtedly has a similar function in that it imparts vitality to the cementum and contributes to its histologic characteristics.

Fig. 9.—High magnification of area of fracture of papillectomized canine seen in Fig. 3. The fractured surface was first resorbed and then repaired (*R*) with osteocementum.

The evidence points to the necessity for an uncalcified surface which stimulates the formation and continuous deposition of cementum. The cementoblasts which give the tissue its histologic appearance are modified fibroblasts arising from the adjacent connective tissue. This is merely one significant factor. Examination of repaired areas of resorbed roots demonstrates that this function does not require an uncalcified base.

Cementum deposition is associated with continuous active eruption. The deposition of cementum elevates the teeth to compensate for loss of structure by attrition. Continuous eruption stimulates the periodontal membrane to deposit

cementum regardless of the qualities possessed by the calcified connective tissue. As already mentioned, the uncalcified surface is normally present. In its absence, such as occurs in the repair of fractured teeth and resorbed areas of cementum and dentine, the continued eruption of a tooth stimulates the periodontal membrane to return to its normal function of cementum formation.

Fig. 10.—Fractured human incisor. Fragments separated by bone trabecula. Fractured surfaces first resorbed, then repaired with cementum.

Resorption of the permanent tooth roots is the result of irritation. Repair generally occurs following removal of the irritant. The process is similar to the repair of fractured roots which may be observed in Fig. 4. Under higher

magnification (Fig. 9) no evidence of an uncalcified zone is present. There is, however, some evidence that resorption followed the fracture. Subsequently, repair occurred by deposition of cementum. Repair of fractured roots by cementum deposition is always preceded by resorption. Fig. 10 is a photomicrograph of a repaired, fractured root. The deposition of cementum followed resorption of the dentine. A narrow trabecula of bone separates both fragments. The connective tissue attachment from the fractured ends to the ingrown bone trabecula simulates a periodontal membrane. Close examination of the bone reveals that eruption of both fragments occurred. Fig. 11 shows a higher magnification of the fractured area. Resorption of the intervening bone on the apical aspect and deposition on the incisal àspect demonstrate the eruption of both fragments. The greater thickness of the periodontal membrane on the coronal aspect of the fracture compared with the lesser thickness on the apical aspect is another manifestation of eruption. In the papillectomized teeth of the cat, active eruption also continued, though greatly retarded. The continuous active eruption probably caused additional increments of cementum to be deposited in the pulp chamber after the initial layer was formed on the predentine.

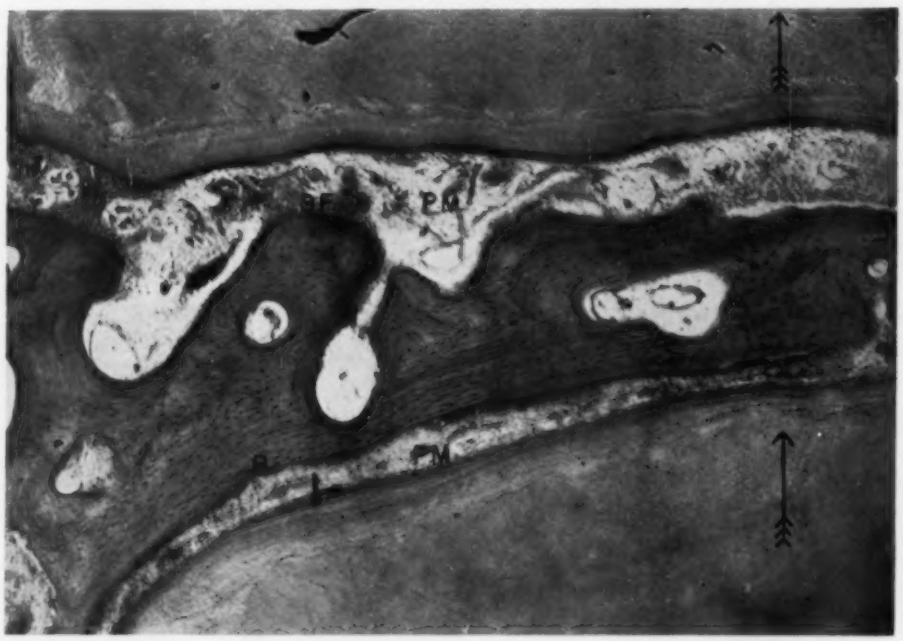

Fig. 11.—Higher magnification of area of fracture. Resorption (*R*) and bone formation (*BF*) of trabecula indicates eruption. Note greater thickness of periodontal membrane (*PM*) on coronal aspect of fracture and lesser thickness on apical aspect as indication of eruption.

The relation between eruption and repair of resorbed cementum is further evident in re-examination of a report on experimental replantation in dogs.[19] The replanted tooth was retained in position by a splint which raised the bite about ½ mm. The splint was removed several weeks postoperatively. Specimens taken from one case before removal of the splint showed resorption and no repair. In other cases, the splint was removed for periods up to ten months before histologic examination. These sections exhibited an initial resorption of the roots followed by cementum deposition.

Fig. 12.—Apical area of replanted tooth ninety-four days after removal of splint. New bone formation (*NB*) at apex demonstrates eruption. Resorbed areas (*R*) of root repaired with cementum.

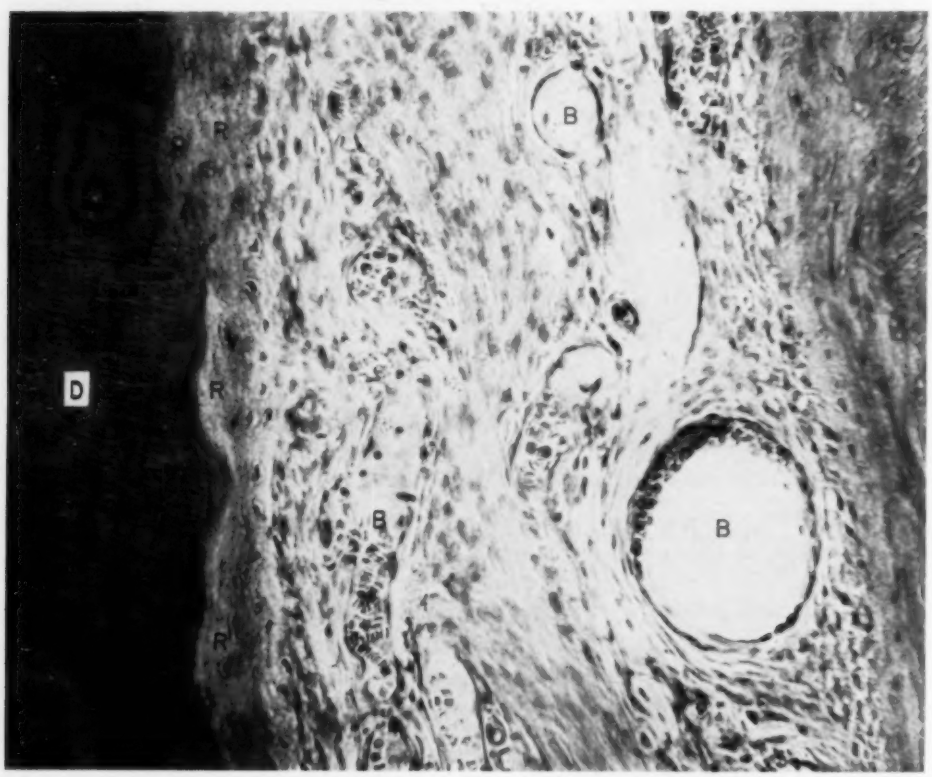

Fig. 13.—Repair of middle third of root after replantation. Resorption progressed into dentine (*D*). Repaired by cementum (*R*). Blood vessels (*B*).

The relation between eruption and cementum deposition becomes clear if one examines the associated phenomena in tooth replantation experiments performed on the anterior teeth. In placing a splint over the anteriors, the posterior teeth erupted to articulation, increasing the intermaxillary distance. The occlusal level was raised approximately ½ mm. Subsequent experiments in the rate of continuous active eruption during bite raising showed that 1 mm. of eruption occurred in the first week.[20] The rate of eruption was greater than the degree of depression of the experimental teeth. In the replanting experiment, therefore, the splinted teeth were not subjected long enough to the entire stress of mastication to be depressed in their alveoli to any great degree. During this period, however, the eruption of these teeth was arrested. Upon removal of the splint, the experimental anterior teeth erupted into occlusion. From the histologic examination of the specimens it is evident that the periodontal membrane reversed its activity from resorption to cementum deposition. Fig. 12 is a photomicrograph of the apical area of a replanted tooth ninety-four days after removal of the splint. The bone deposition at the apex demonstrates the amount of eruption of the experimental tooth. Repair of the resorbed apex (*R*) may be observed. Fig. 13 is a photomicrograph of an area of repair in the middle third of the root. The original cementum was completely resorbed affecting also the surface of the dentine (*D*). A new layer of osteocementum has been deposited upon the resorbed surface of the dentine.

Fig. 14.—Photomicrograph of section of roots of two molars of dog. Arrows indicate direction of movement. Right root depressed, left root erupting. Note increased thickness of cementum (*C*) on erupting root.

Further light may be shed upon the relation of eruption to cementum deposition in a study of tooth depression.[20] In one phase of the experimental procedure, depression of one molar occurred while the adjacent teeth were permitted to erupt, because of an increased intermaxillary distance. Depression is the antithesis of eruption. Fig. 14 illustrates the results of depression and

eruption on cementum deposition. The arrows indicate the direction of movement of the teeth. The depressed second molar exhibits a thin layer of cementum which contained many areas of resorption. The erupting third molar shows an increased thickness of cementum demonstrating the relation between eruption and cementum deposition.

The biochemical activity of the periodontal membrane is dependent upon its normal function. In part, it causes bone changes and cementum deposition as the continuous active eruption progresses. Reversal of this activity occurs when the normal eruption is arrested. Trauma, which is frequently a stress preventing continuous active eruption, is ofttimes the cause of resorption of cementum. Elimination of the irritant permits the tooth to resume its normal function. Repair of the cementum generally follows.

CONCLUSION

Cementum formation may be divided into two phases. The formation of the primary layer is dependent upon a poorly or uncalcified base similar to the granular layer of Tomes. In the absence of odontoblasts, a bonelike tissue resembling cementum may be deposited upon the calcium-free predentine. Subsequently, increments may be stimulated by the osteoid-like surface precementum. The repair of resorbed tooth roots may be benefited by continuous active eruption. This process, associated with cementum formation, may occur in the absence of a calcium-poor or calcium-free layer.

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DISCUSSION

Dr. Leuman M. Waugh.—Dr. Lefkowitz has been actively engaged in doing research for us in the Division of Orthodontics. I think his interest has been stimulated because of the fact that he has been associated with Dr. Bodecker in teaching the graduate students during the last two or three years. It is particularly gratifying to me to have a man of his ability take an increasing interest in our orthodontic problem. He asked me if I would try to give practical application to what he had to tell us this morning. I presume that was done because he feels, as do all of us, that science is valuable only in so far as it can be applied; also that research is applicable only in so far as it is properly interpreted. Being himself a researcher and a general practitioner in dentistry, may I say of no mean parts, he felt that he would rather have the orthodontic interpretation given by one who had had more experience clinically, and on that basis I told him that I would be glad to check it up with some of the things that had been of interest to us from the clinical standpoint.

In that connection his very nice review of what we know of the histology and embryology of cementum is important. Of course, I think all of us who have studied progress along this line, especially when we check up our resorptions, and when we try to account for eruptions and retarded eruptions with and without our orthodontic appliances, feel very grateful to the group of researchers who are giving us more on the dental structures involved. As they have done so, cementum has taken on a much greater proportion of importance.

Cementum, together with its formative tissue, the precementum, finally determines whether a root is to be retained or is to be lost. The pulp may be devitalized, all of the enamel may be gone, a great deal of the dentine may be destroyed pathologically; yet if there is a core sufficient to permit a healthy cementum and a healthy periodontal membrane, that root can be made useful for function in the mouth, so that the cementum and precementum are, perhaps, from that respect, the most important of our orthodontic structures—valuable also to the general practitioner for restorative purposes.

One thing that Dr. Lefkowitz pointed out, which I think we should not forget in orthodontics, is that cementum continues to grow throughout life. Bone is resorbed and reformed, but we in orthodontics fortunately have in cementum a tissue which stands by us with more or less persistent active growth, stimulated and retarded in its growth according to the stresses surrounding it. This, of course, is also most important to the periodontist.

Dr. Lefkowitz—and I am going to come very quickly to the two essential points now in his paper—has shown us the precementum in his slides very clearly. We have a preformation for all of our calcified structures, that of inorganic deposits. We have the osteoid. In childhood the osteoid is present in such large proportion that one could take the forearm of an infant and bend it between the hands without causing pain particularly, and without doing any harm, but that same bone in the individual at 60 years will be quite different. It will snap very much more easily, the difference being in the deposition of inorganic constituents and the other aging tendencies. In dentine we have the predentine, and in cementum Dr. Lefkowitz demonstrates clearly that we have a precementum. Its importance to us is great because of the fact that so long as it is vital we may have a cementum well built. The importance of the precementum is especially great to us in orthodontics when we study the stresses in type and in amount that we put onto the structures. I think it was Dr. Kronfeld who first said in his measurement of the pressure of blood in the capillaries that we had there 7 or 8 grams of pressure. To me that was very important, because in some of our appliances, especially those which take hold of a tooth so they produce bodily movement, moving the tooth throughout its entire length, we should be especially cautious in our judgment. It does not contraindicate that type of tooth movement, but it does mean that we should be especially careful because if we produce too much pressure in an area, circulation is so slowed that stasis or stoppage of circulation takes place. That is the point at which we have changes that we certainly do not want. Those same changes would have their influence upon the precementum.

While precementum is vital, we have the cementum growing, but when it is carried to a point where it is devital, as Dr. Lefkowitz has nicely shown us, those of us who accept what he has shown as demonstrating its validity, feel that there cementum will cease to grow, so that the precementum, that uncalcified layer, especially on the outer side of the roots and perhaps in the bifurcations of teeth, should be thought of. We should think of this especially in depressing teeth. We have had a great many discussions about the depression of teeth. We have had histologists the nation over, even Dr. Gottlieb himself, saying that the depression of a tooth is practically an impossibility, yet you and I as clinical orthodontists know very well that we depress teeth almost every week in our practices. We do know that teeth do depress. Histologically I do not know whether they have quite explained to their satisfaction how it happens, but you and I know that it does happen. Dr. Lefkowitz is engaged in a number of problems along that line, of which this depression of teeth is only one that is now being carried on in a scientific way and about which a report will be forthcoming later.

Secondly, the retention of vitality of the precementum is important because the epithelium—and this really was very intriguing to me—does not grow down from the cervix of the tooth toward the apex over a vital precementum. We know how anxious we are not to have resorption of the crest of bone, we know how anxious we are not to have our cementum interfered with in this area, and I think that is an important thing because as the precementum is rendered devital from the cervix toward the apex, epithelial tissue can then grow in that area—a most undesirable thing from the orthodontic standpoint.

Maintaining the precementum in health is most important in eruption, and in depression the reverse process occurs, so that we must also be cautious from that standpoint.

I think, Dr. Lefkowitz, I have tried to give practical application to the points that you have brought out especially as additions to our knowledge in this field, and personally I want to express my gratitude to you for the interest you have shown in our field, and to tell you that we look for further reports.

Dr. Lefkowitz will have a report to give at our meeting in Chicago, which you will enjoy hearing also, and which I think will be helpful in explaining some of the changes that occur to teeth under orthodontic encouragement and why changes result from certain pressures which we give.

THE SURGICAL CORRECTION OF MESIOCLUSION

SAMUEL HEMLEY, D.D.S., F.A.C.D.,* NEW YORK, N. Y.

THE patient, M. R., female, was 19 years, 3 months, of age. She had an Angle Class III malocclusion (Fig. 1). She gave a history of having received orthodontic treatment for a period of six years.

Roentgen examination (Fig. 2) revealed the loss of the mandibular right and left first and second molars and the maxillary right first molar. There was root resorption of the maxillary and mandibular incisor teeth.

The full face and profile (Fig. 3) pictures clearly depict the unpleasant appearance associated with the relatively short ramus, long body of the mandible, and the obtuse gonial angle. The tooth views (Fig. 4) show the lack of harmony in position of the dental arches.

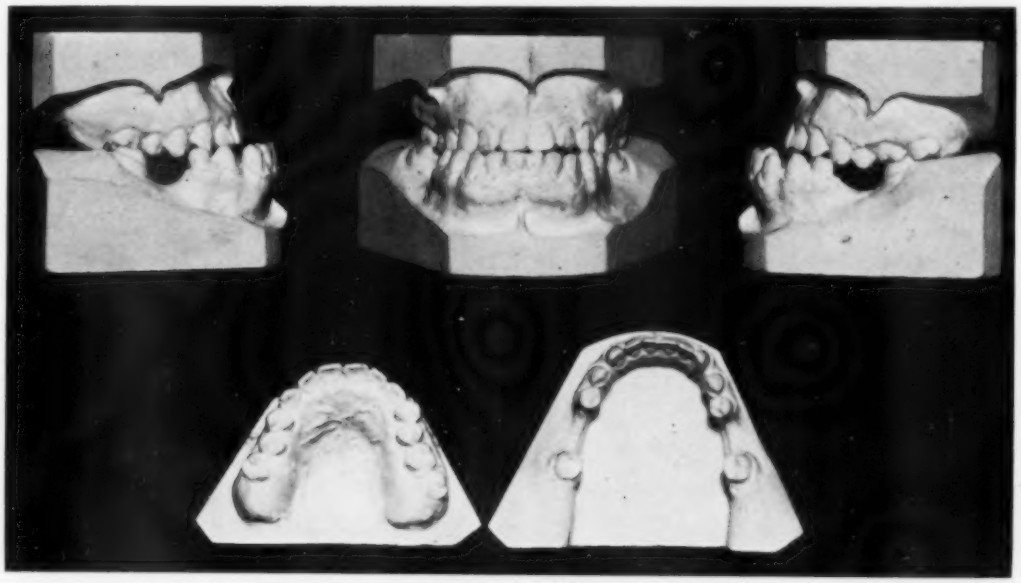

Fig. 1.—Casts showing mesioclusion after six years of orthodontic treatment.

It was decided that surgery was the only means of correcting both the occlusal disharmony and the facial form. The first step in planning treatment was to determine the degree of harmony which prevailed between the arches both as to form and size. For this purpose, casts were approximated. Fig. 5 shows the occlusion which was anticipated before sectioning. When indicated, orthodontic therapy should be done in advance. It is essential that there be that degree of harmony between the arches which will permit sufficient inter-

Presented at the Annual Meeting of the New York Society of Orthodontists, March 6, 1944.

*Head of the Department of Orthodontics, New York University, College of Dentistry.

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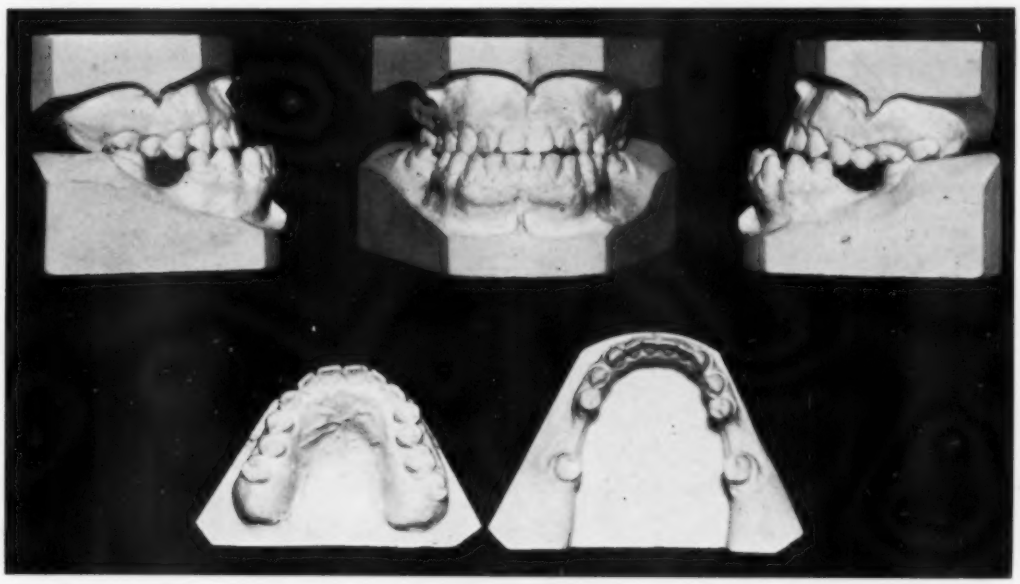

Fig. 1.—Casts showing mesioclusion after six years of orthodontic treatment.

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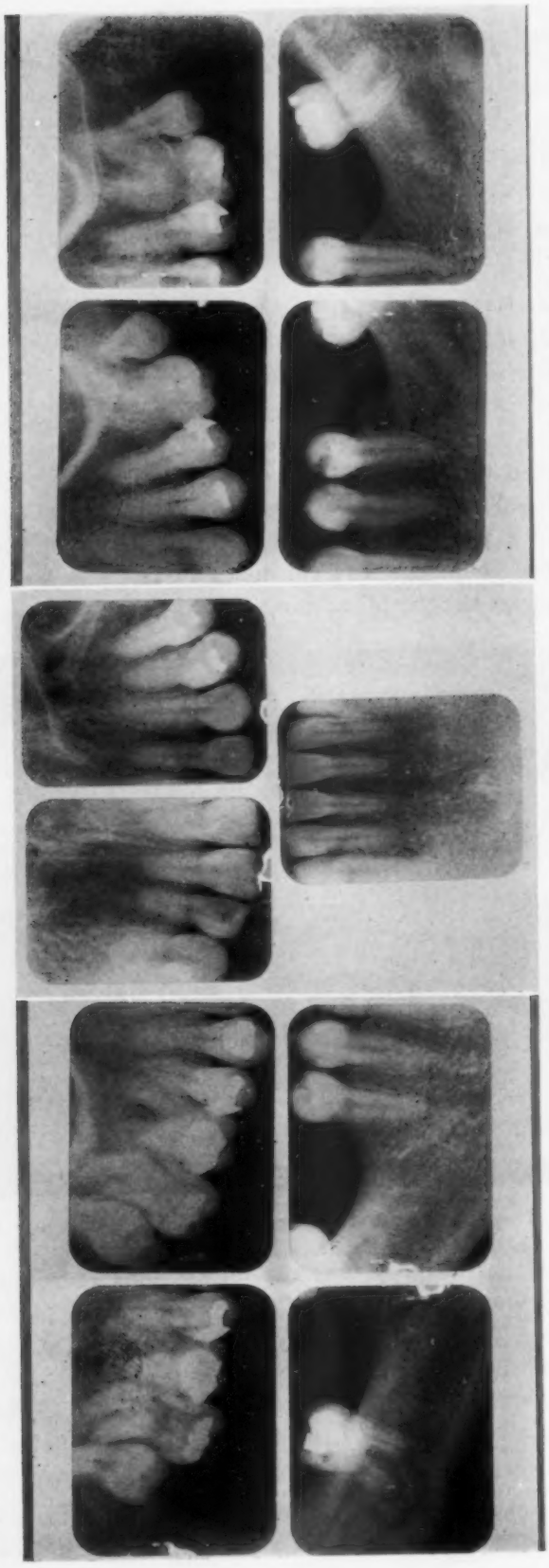


Fig. 2.—Roentgenograms of the dentition shown in Fig. 1. Note the root resorption of the incisor teeth.

locking to assure stability. Appliances must be securely adjusted in advance of the operation (Fig. 6).

The next problem which arises is the choice of the site for sectioning. Many sites have been used, such as the neck of the condyle, the ramus above the inferior dental foramen, and the removal of a section of the body of the mandible.

Fig. 3.—Full face and profiles of the patient whose casts are shown in Fig. 1.

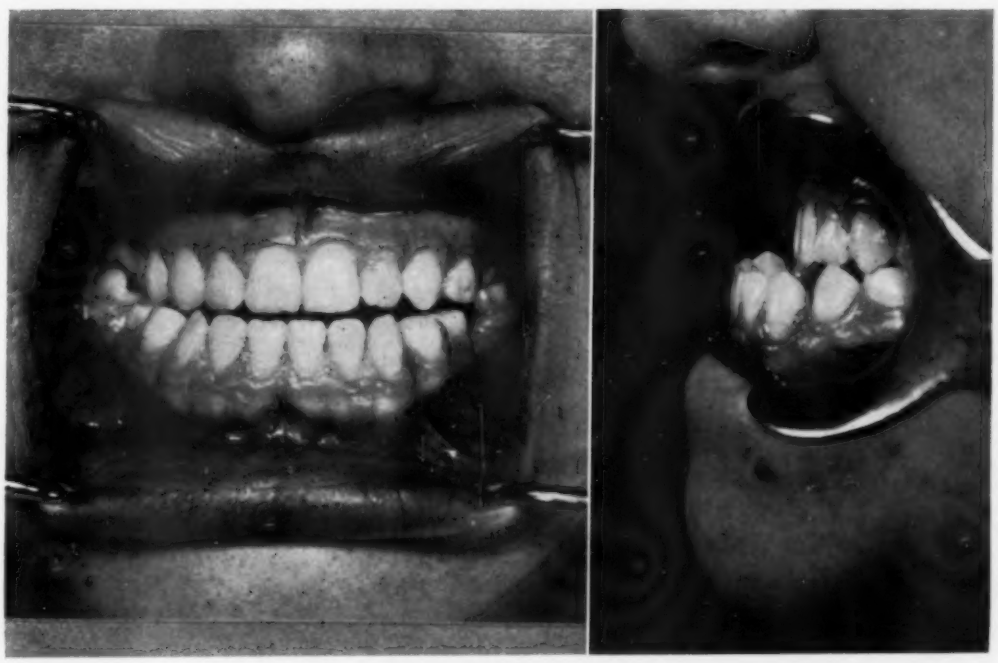


Fig. 4.—Tooth views of the patient whose casts are shown in Fig. 1.

In choosing a site, the two objectives must be considered: first, the establishing of a normal occlusal relationship, and second, the correction of the facial

deformity. The occlusal relationship can be corrected with the choice of any of the sites mentioned. However, the facial deformity is not most advantageously corrected by the use of these sites. A study of the mandibular form reveals a relatively short ramus, long body of the mandible, and an obtuse gonial angle.

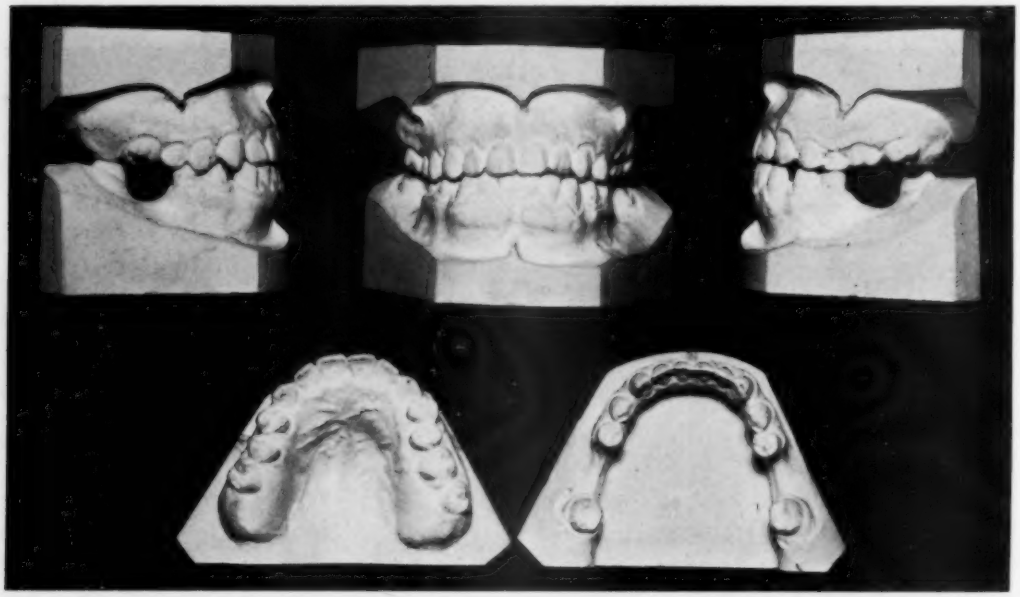


Fig. 5.—Casts of the case shown in Fig. 1, before operation, related to show harmony in size and form of the dental arches.

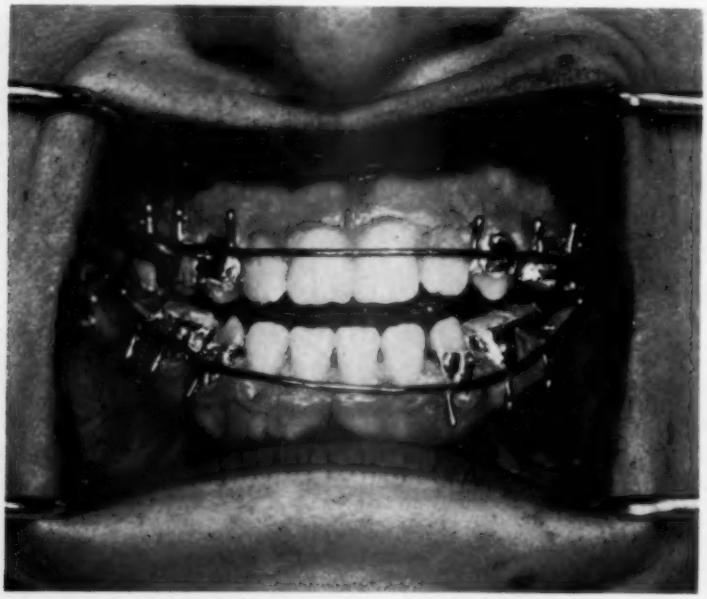


Fig. 6.—Splints in position preparatory to sectioning of mandible.

All of this is immediately corrected by sectioning through the gonial angle. This permits of an immediate change, establishing at once a relatively longer ramus, shorter body of the mandible, and a normal gonial angle. Fig. 7 shows the mandible before and after sectioning.

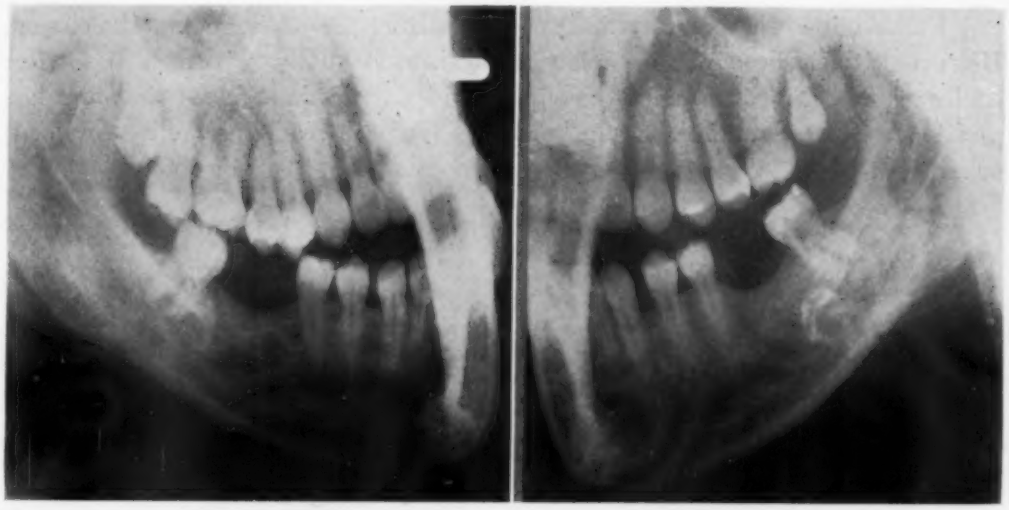


Fig. 7*A*.—Roentgenograms of mandible before sectioning.

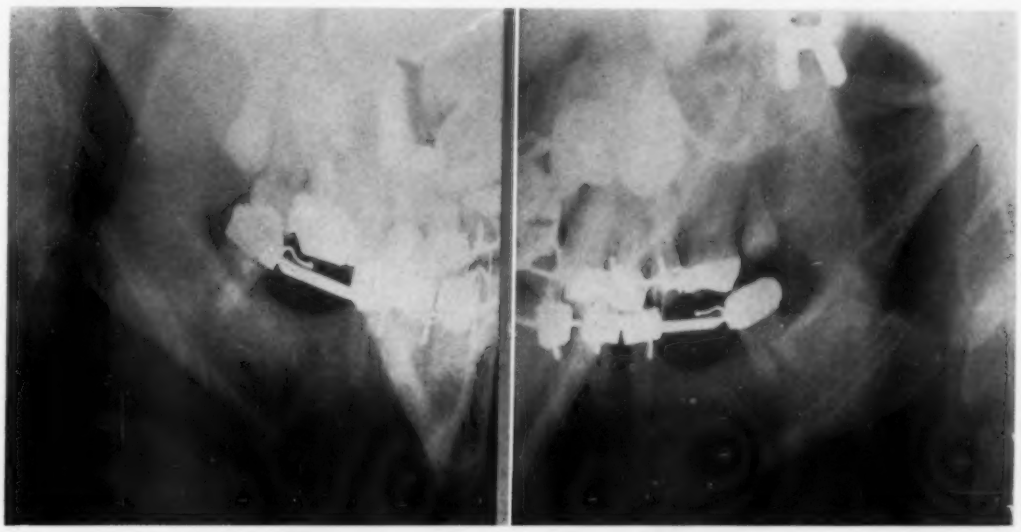


Fig. 7*B*.—Roentgenograms of mandible one week after sectioning.

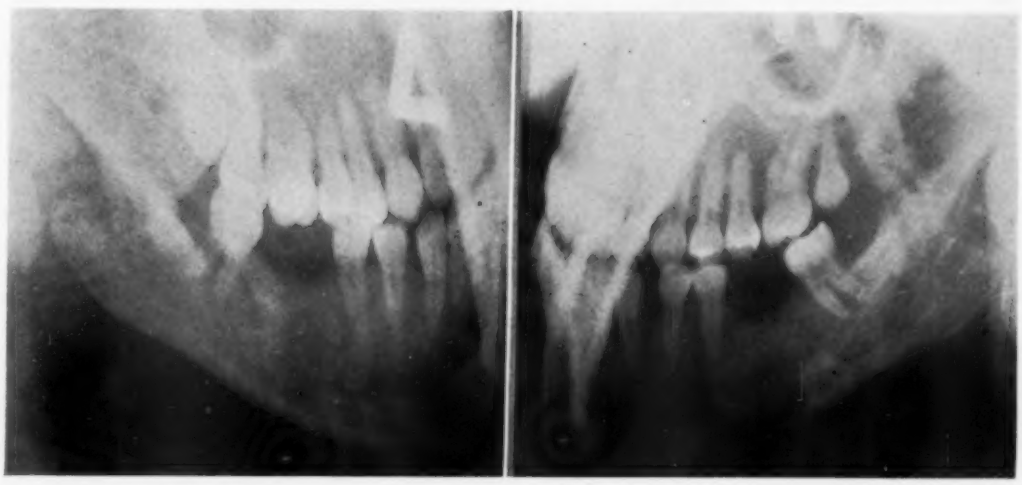


Fig. 7*C*.—Roentgenograms of mandible five months after operation.

Following sectioning, any means of stabilizing the segments may be chosen. However, it has been our experience that intermaxillary wiring is the safest choice (Fig. 8). The pull of the suprahyoid muscles is so great that any less positive method of stabilizing the segments tends to result in the development of an open bite.

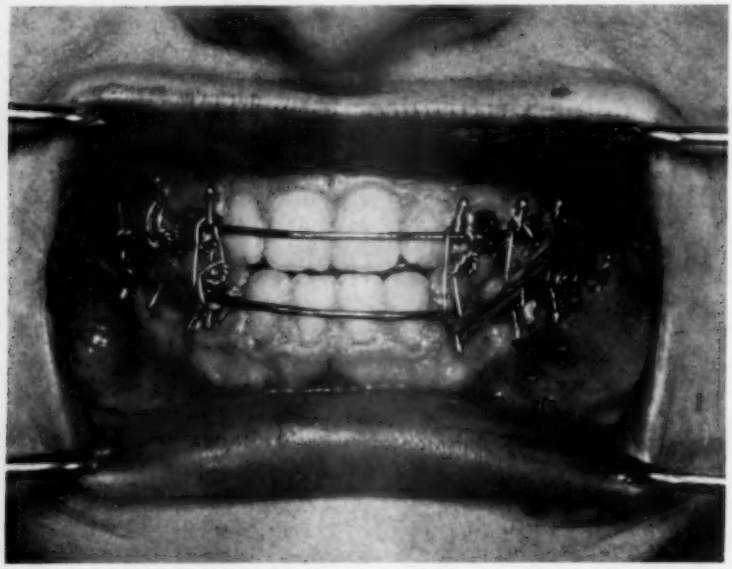


Fig. 8.—Tooth view to show intermaxillary wiring.

Fig. 9.—Full face and profiles of patient five months after operation. Compare with Fig. 3.

By sectioning through the gonial angle, the temporal, and, to some degree, the masseter and the internal pterygoid muscles are deprived of their influence on the body of the mandible. As a result, until the parts are stabilized, the

patient experiences extreme difficulty in swallowing. As soon as the parts are stabilized, the patient can again swallow with ease. Thus, we have brought to our attention forcibly the action of the elevators of the mandible as a necessary adjunct in deglutition.

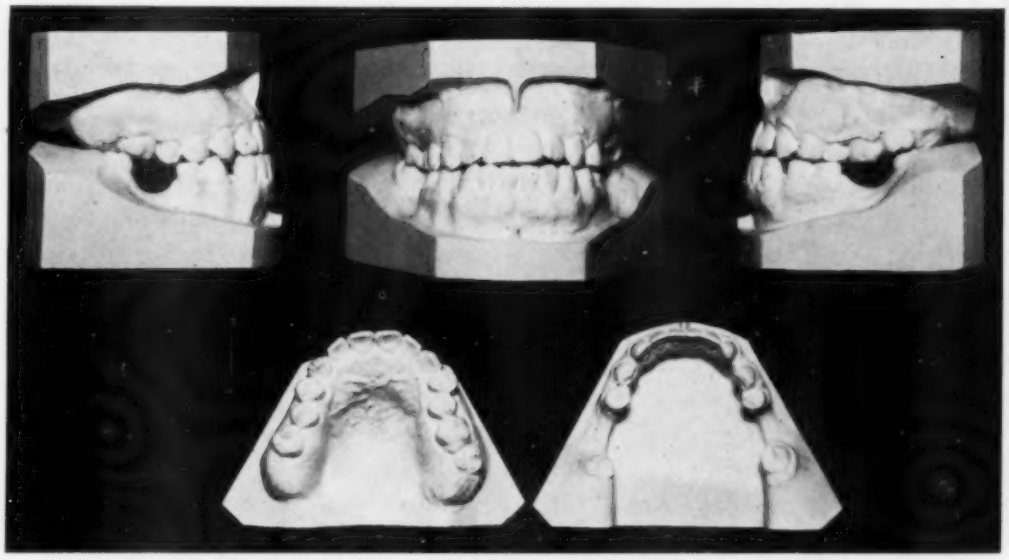


Fig. 10.—Casts of dentition five months after operation. Compare with Fig. 1.

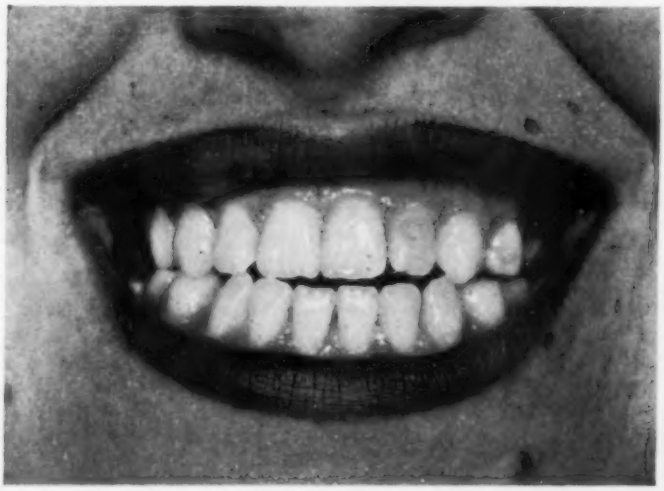


Fig. 11.—Tooth view five months after operation.

The patient is hospitalized for a few days only, and union of the fractures takes place as it would following any simple fracture. Fig. 9 shows the patient three months after operation. It has not been possible to follow the case further because the patient resides some three thousand miles away. Fig. 10 shows the casts of the occlusion three months after the operation, and Fig. 11, the tooth view.

There are two factors of special interest with regard to Class III cases of this type: the first of these is the question of etiology, and the second is the possibility of treatment by means of conservative orthodontic procedures.

In discussing etiology, we should note that the more severe cases of Class III malocclusion all manifest a characteristic malformation of the mandible; a relatively short ramus, long body of the mandible, and an obtuse gonial angle. The study of etiology in these cases has long been confused by the concept that the gonial angle varies with age, being obtuse in infancy, less obtuse at maturity and ultimately acquiring the obtuse form again in the aged. Brodie's findings definitely disprove this theory. He has shown that the gonial angle is constant, the error previously having been the method of measuring this angle. This type of malocclusion with its attendant malformation can be found at any age, and we must, therefore, seek the etiological factors in the earlier stages of development. Any condition which is capable of altering muscle pressure during the most active periods of bone growth is capable of producing a malformation. The masseter and the internal pterygoid muscles are attached to the ramus of the mandible and virtually form a sling about the gonial angle. Exaggeration of the contraction of these muscles during the first year of life when there is a generalized and extensive growth of the mandible is capable of producing this deformity. This exaggeration of muscle pressure would prevent the normal amount of deposition of bone at this site. Any disturbance which results in tetany in this stage of development is therefore capable of producing this condition. Hess has pointed out that tetany is not uncommon in early infancy. It may be associated with rickets, or it may be of the infantile variety, "the so-called idiopathic tetany of infants." The variations of this condition which may exist in a latent or manifest form may produce this malformation of the mandible depending on the severity of the condition and its duration. When the form of the mandible is thus disturbed, it becomes the pattern for later development even though the etiologic factor no longer exists. There is no force produced by the normal function of the muscles which is capable of producing a return to the original pattern.

The next point of interest is the prognosis when conservative orthodontic procedures are followed in the treatment of this type of case. By conservative orthodontic procedures, I refer to the use of orthodontic appliances as a means of establishing a normal occlusion. In this connection, in the AMERICAN JOURNAL OF ORTHODONTICS, September, 1938, page 836, I stated that "no textbook and no scientific journal that has ever come to my attention has demonstrated one of these cases successfully completed"; and further, "if Class III malocclusions in which there is a definite overgrowth of the body of the mandible have frequently been treated with good success, I think that the individual or individuals who have such cases to demonstrate owe it to the profession to report them."

In the April, 1940, issue of the AMERICAN JOURNAL OF ORTHODONTICS, page 346, Dr. Fred Winter, in answer to this statement, writes: "This remark and the wish to fulfill the mentioned duty toward the profession have induced me to report a case belonging to Class III which was treated with permanent success." Figs. 12 and 13 illustrate one of his cases. The different positions of the head in the profile pictures in no way conceal the fact that there has been no change; and the axial inclinations after treatment are typical of this type of malocclusion even five years after treatment.

He describes another case as follows (AMERICAN JOURNAL OF ORTHODONTICS, 1940, p. 351): "Incidentally I would like to mention a case belonging to Class III which could no more be treated, as all maxillary teeth are missing, except the right canine. An almost normal occlusion was obtained, however, by applying a suitable construction of the artificial denture. The proper method for such

A. *B.*

Fig. 12.—Profiles as shown by Dr. Fred Winter, *A*, before, and *B*, after treatment of a Class III case. Note the different positions of the head.

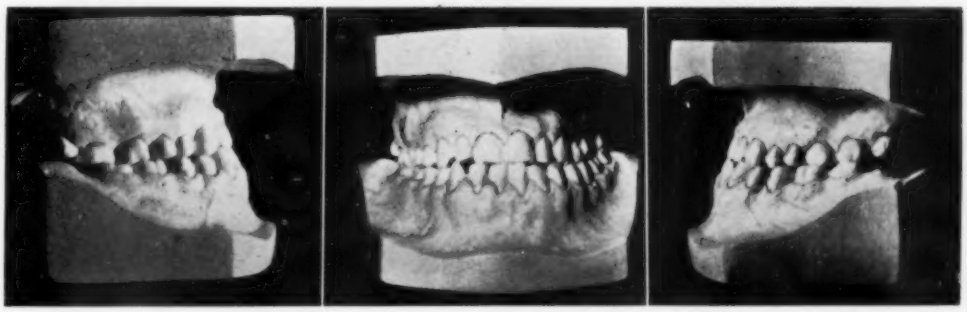
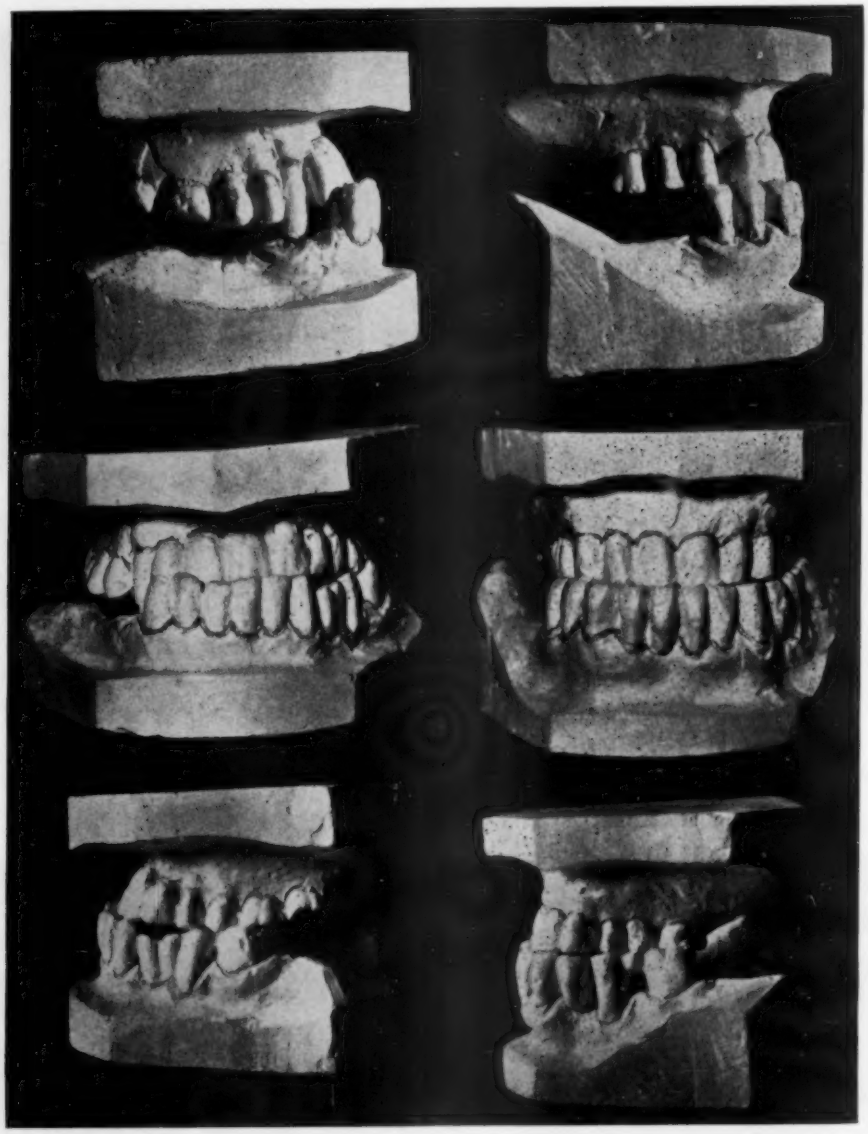


Fig. 13.—Casts of the treated case shown by Dr. Fred Winter. Note the marked lingual and distal axial inclinations of the mandibular teeth and the mesial and labial axial inclinations of the maxillary teeth.

cases is a particular formation of the curve of Spee. Gysi, the inventor of this method, called it 'Hoeckerloses Gebiss mit negativer Schneidezahnfuehrung.' This means that cuspless artificial teeth are inserted, giving the inclined plane of the incisal rod of the Trubyte articulator a reversed inclination." Despite

the fact that he states that there was but one maxillary tooth present, the right canine, his illustration of the case before treatment, Fig. 14, *A*, shows many maxillary teeth present and the completed case, Fig. 14, *B*, still shows a mesial relationship of the mandibular arch despite the application of "a suitable construction of the artificial denture."



A. *B.*

Fig. 14.—Casts of another case reported by Dr. Fred Winter.
A, Despite the fact that it was reported that "all maxillary teeth were missing, except the right canine," the casts show many maxillary teeth present.
B, Casts after treatment still show a Class III relationship even after "applying a suitable construction of the artificial denture."

This only emphasizes the need for a more uniform concept of normal occlusion.

With reference to more orthodox methods of treatment, we must consider: (1) The possibility of moving all of the teeth bodily to new positions. (2) The

possibility of changing the form of the glenoid fossa, or of the condyle of the mandible, or of the relationship of the condyle to the neck of the condyle.

The answer to the first of these factors should be evident in the light of the most recent trend in orthodontics. If teeth could be moved into, and retained in, any position thought necessary, it would never have been necessary to adopt any standard other than Angle's hypothetical ideal or, subsequently, Simon's hypothetical ideal.

The next approach is the one that attempts to change one or more of the component parts of the temporomandibular articulation. To do this, pressure must be exerted on the condyle. This pressure may be transmitted through the mandibular teeth to the condyle, or, as with the chin cap, through the soft tissues overlying the chin. In discussing the influence of pressure, it is important to note, as Greig has stated, that "It is unreasonable to expect that connective tissue should react in one way in one part of the body and in another way in another part of the body. Conformity in the pathology of the same variety of tissue throughout the body is strong presumption of the correctness of any theory of its growth, disintegration and repair, and to this the pathology of bone is no exception" (p. 14). This, of course, applies to cartilage as well as to all other tissues.

Pressure transmitted through the teeth will affect both the paradentium and the cartilage of the temporomandibular joint. We find cartilage in the various joints of the body where its greater elasticity breaks the shock to bone. It is an avascular tissue and "a structure of low metabolism" (Greig, p. 19). The alveolar process and the periodontal membrane, on the other hand, have a copious blood supply and respond readily to pressure. We find that the investing tissues of the teeth are affected more readily than cartilage. If pressure of sufficient severity is applied, the cartilage may be affected, but the teeth and the supporting structures will have been sacrificed. In this manner, the very structures we are most interested in will be lost without effecting any appreciable change in the form of the mandible. When the chin cap is used, decubitus of the soft tissue overlying the chin occurs long before the more resistant cartilage can be affected.

In conclusion, we find in the more severe forms of Class III malocclusion that:

1. The mandible has a relatively short ramus, long body and an obtuse gonial angle.

2. The etiological factors are effective in the first few months of life.

3. Even though harmony in size and form of the dental arches be obtained, there is lack of harmony in position of the dental arches.

4. Conservative orthodontic therapy has not produced satisfactory results.

5. Sectioning through the gonial angle permits the establishment of harmony in position of the dental arches, alteration of proportion between the ramus and body of the mandible and the best possible esthetics.

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ACRYLIC OR VULCANITE REMOVABLE APPLIANCES

JACOB STOLZENBERG, D.D.S., BROOKLYN, N. Y.

THIS paper is not intended to introduce removable appliances as a new phase of orthodontic treatment. The worthiness of removable appliances has been well established in the past. The intention of the writer was to formulate and classify the material gathered over a period of years, and evaluate the merits of each type. This classification will include the various designs according to their indication and use. References throughout the paper can be applicable to either the vulcanite or acrylic appliance.

Vulcanite appliances were used by Dr. Kingsley as far back as 1874 for the correction of malocclusion. With the advance of the science of orthodontics, the vulcanite appliance was discarded as an appliance for correction, and was followed by the labial and lingual appliance techniques as a means of correcting malocclusion. In 1919, Dr. Hawley described the Hawley retainer as a vulcanite appliance used primarily for retention.

The appliance shown in Fig. 1 is used at the completion of regulation to retain the teeth in their new positions and the arches in their expanded forms. The maxillary retainer, with the inclined plane behind the anterior teeth, is for depressing the mandibular anterior teeth, and keeping the mandible in a forward position.

Up to the present writing there have been many modifications of the Hawley retainer. In principal, the purpose of retention has been paramount, but with modifications of the design, the appliance has been used successfully for the correction of certain types of malocclusion and malrelationship of the arches.

The orthodontist's modus operandi is usually a mechanical appliance which may be either fixed or removable. The removable appliance for corrective treatment, such as the Jackson appliance, has been considered passé by leading orthodontists. While the disadvantages of the removable appliance are numerous, there are times when a removable appliance is indicated for its efficiency and applicability. The vulcanite appliance, which was designed by Hawley for retention, can be modified and used for corrective treatment with a minimum of mechanical therapy and a maximum of efficiency.

It is the writer's intention to demonstrate that the vulcanite or acrylic appliance is used only in certain cases for complete correction, while in other cases it serves as an auxiliary appliance. The success in the use of the appliance depends upon the cooperation of the patient. These appliances can be used by youngsters, as well as adults, with equal success.

For the purpose of study, I have divided them into four types:

Type 1. Maxillary or mandibular appliance, with an incline.
Type 2. Maxillary or mandibular appliance without an incline.
Type 3. Maxillary or mandibular appliance with the material missing behind the anterior teeth.

Presented at the annual meeting of the New York Society of Orthodontists, March 6, 1944.

Type 4. Maxillary appliance, a combination of Type 1 and Type 3.

To any of the above-mentioned types, teeth or springs can be added for the individual requirements.

Type 1 is an appliance with an inclined plane which may be used in maxillary or mandibular arches. In the maxillary arch, this appliance is used for the following:

1. Maintain arch form.
2. Open the bite posteriorly.
3. Depress the lower anterior teeth.
4. Correct an overbite, and allow for vertical development.
5. Maintain the mandible in a forward position.
6. Rotate anterior teeth, by manipulation of the labial wire.
7. Retain teeth which were rotated.

Fig. 1.—Left, modified Hawley retainer; right, Hawley retainer.

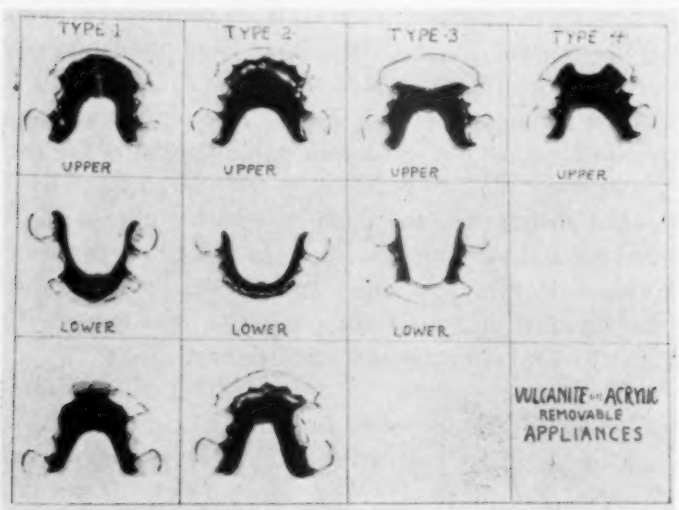

Fig. 2.—Illustrating types of removable appliances.

In the mandibular arch, the incline originates from the incisal edges of the anterior teeth, and is directed upward and posteriorly. This appliance is used for the correction of some Class III malocclusions, or used as an aid. It is also used to correct maxillary anterior teeth that are in lingual version.

Type 2 is an appliance which fits the palatal or lingual surface in the maxilla or the mandible. It simulates Type 1, except that it has no inclined plane.

It may be constructed without a labial wire. Expansion springs may be added, depending upon requirements. This appliance is used for the following:

1. After treatment, to maintain the arch form, when the overbite is correct.
2. Maintain the corrected positions of the rotated teeth.
3. Act as a base to hold finger springs for some tooth movements.

Type 3 is similar to Type 2 except that a portion of the palatal or lingual part of the appliance is missing behind the maxillary or mandibular anterior teeth.

This appliance is used for the retraction and closure of spaces of the maxillary and mandibular anterior teeth. This appliance overcomes the need for a labial appliance mechanism, which may disturb the anchorage teeth.

Type 4 is a combination of Type 1 and Type 3 for use in the maxillary arch only. This appliance is indicated in an incipient Class II, Division 1 malocclusion, where the maxillary central incisors are protruding, and there is a maxillary overbite, with the mandible in distal relationship.

Before deciding upon a method of treatment, a complete diagnosis should be made, including a graphic representation of the teeth in the arch form. This study is determined by the Hawley arch form, in conjunction with the Pont's index. The graph is produced with the delineascope, which was designed by Dr. Waugh,[1] or with the dental copyscope.[2] If the indications are such that there is no need for posterior rotations or marked expansion, and the abnormality simulates that previously mentioned in the classification, then a simple correction can be obtained with a minimum of mechanical therapy, by the use of removable appliance.

The following case reports will demonstrate some of the cases where the removable appliance was the only appliance used. Sometimes a lingual appliance is used to facilitate the correction.

Case 1.—Female patient, aged 11 years.

Figs. 3, 4, and 5 present a Class I malocclusion accompanied by the protrusion and spacing of the maxillary and mandibular anterior teeth. Both arches are in mild contraction. A No. 3 maxillary appliance was inserted to retract the protrusion and close the spaces of the anterior teeth. This retraction of the maxillary anterior teeth brought about the retraction of the mandibular anterior teeth as well. After the retraction was completed, a No. 1 retainer was inserted to allow for vertical development.

Case 2.—Female patient, aged 7 years.

Diagnosis.—Angle Class II, Division 1, incipient.

Etiology.—Thumb-sucking up to commencement of treatment.

Description.—Contracted arches, protrusion of the maxillary central incisors, and a distal relationship of the mandible.

Treatment.—Expansion of the maxillary deciduous canines with a lingual appliance with finger springs in the canine areas. The lingual appliance was removed after the deciduous canines were expanded so that the mandible could slide forward without interference. A vulcanite No. 4 appliance was inserted

Fig. 3.—Lateral view.

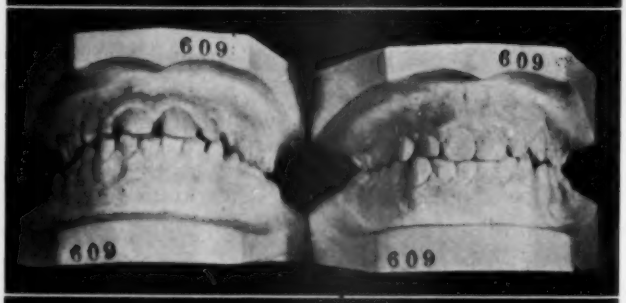

Fig. 4.—Front view.

Fig. 5.—Occlusal view.

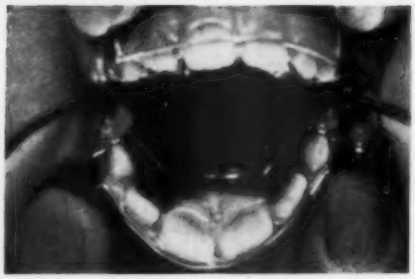

Fig. 6.—Vulcanite No. 4 appliance inserted.

Fig. 7.—Lateral view.

Fig. 8.—Front view.

(Fig. 6). The vulcanite behind the central incisors was missing, so that the central incisors could be retracted without palatal interference. Behind the lateral incisors and canines there was an inclined plane, in order to maintain the mandible in a forward position. During the course of treatment the patient was instructed to do the pterygoid exercises. Figs. 7 and 8 show the lateral and front views.

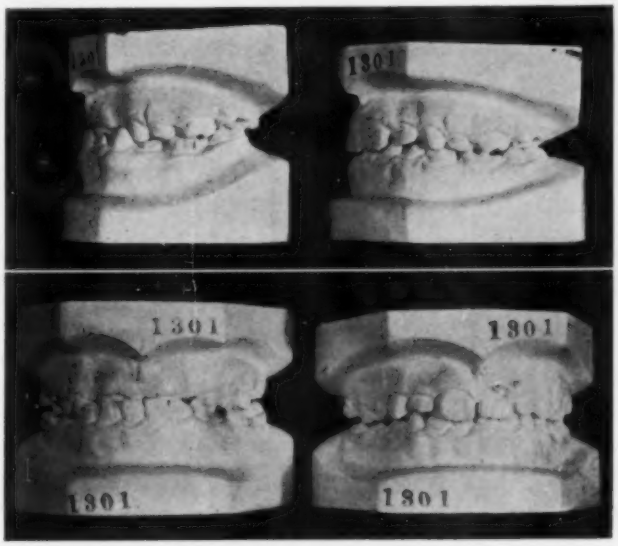

Fig. 9.—Lateral view.
Fig. 10.—Front view.

Fig. 11.—Vulcanite appliance in position at beginning of treatment.
Fig. 12.—Intraoral view eleven months after treatment was started.

In the correction of Class III malocclusion, where the mandible is not too far in advance of the maxillary anterior teeth, I find that the No. 1 lower retainer with an incline is an invaluable aid in obtaining a rapid result, that is, in bringing the maxillary anteriors over the mandibular incisors. This appliance can produce condylar changes.

Case 3.—Female patient, aged 8 years.

Figs. 9 and 10 present a Class I malocclusion which is an incipient Class III. These cases, if neglected, invariably develop into a severe Class III with a marked facial deformity.

Treatment.—A lower No. 1 retainer was inserted with an inclined plane commencing on the incisal edges and running upward and posteriorly. After

one month, the maxillary incisors were in their correct relationship to the mandibular teeth. Fig. 11 shows the bite plane in position. Fig. 12 shows the intraoral photograph of the teeth after the appliance was removed.

The finished casts were taken eleven months after treatment was instituted.

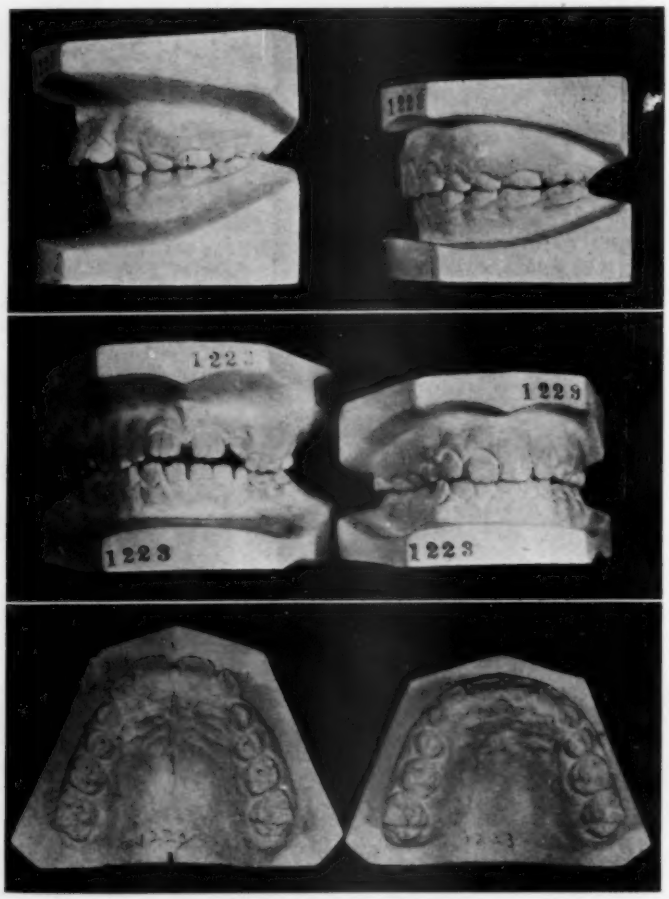

Fig. 13.—Lateral view.
Fig. 14.—Front view.
Fig. 15.—Occlusal view.

Case 4.—Female patient, aged 8 years.

Diagnosis.—Class II, Division 1, bilateral distal occlusion.

Treatment.—The insertion of a No. 3 retainer, in which the palatal portion behind the anterior teeth is eliminated. The loops of the labial wire are contracted and the incisor teeth respond rapidly to treatment. After retraction was completed, a No. 1 retainer was inserted. This appliance permits retention and vertical development.

Figs. 14 and 15 show the closure of the spaces of the mandibular anterior teeth as well as the maxillary teeth. There was no appliance used on the mandibular teeth. The entire length of treatment was seven months.

When the transition of dentition is completed, the first permanent molars will drift forward into their normal mesiodistal relationship.

CASE 5.—Female patient, aged 18 years.

Diagnosis.—Class II, Division 2, atypical. In the maxillary arch the overbite of the anterior teeth extended to the left first premolar. In the mandible the left canine and the first premolar were missing, and the patient was wearing a partial denture.

Treatment.—A No. 4 acrylic retainer was inserted. Behind the left central and left lateral incisors the material was removed, and an inclined plane was built up behind the left canine and the right central and lateral incisors to open the bite.

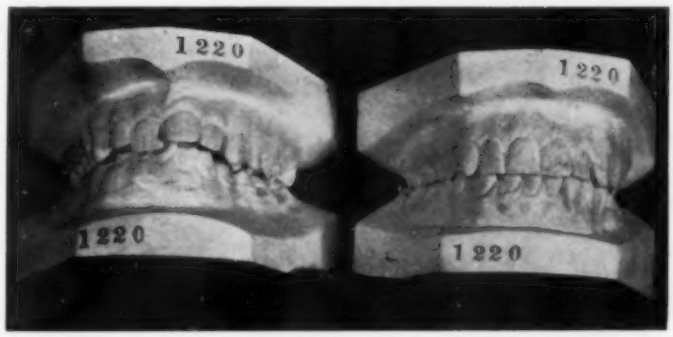

Fig. 16.—Before and after treatment.

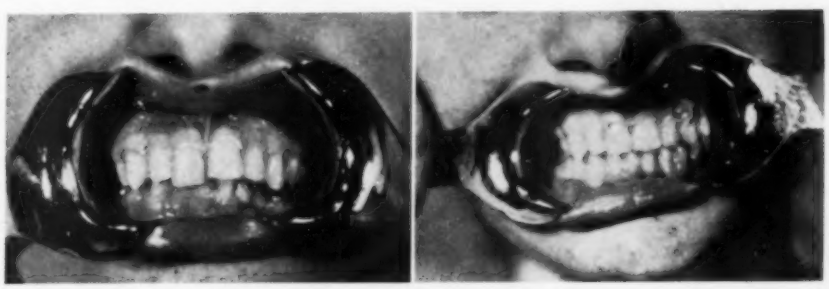

Fig. 17.—Intraoral view before treatment.
Fig. 18.—Intraoral view after treatment.

The left central and lateral incisors were retracted, after which an inclined plane was added behind these teeth. The mandibular anterior teeth were depressed, and there was a forward positioning of the mandible. Figs. 17 and 18 show the intraoral photographs at commencement of treatment and sixteen months later.

CONCLUSION

It is the opinion of the writer that removable appliances can be successfully used in orthodontic treatment where indicated. The advantages in the use of removable appliances are:

1. Greater convenience to those patients whose profession or employment make the wearing of a fixed appliance objectionable.
2. Elimination of the wearing of bands and cumbersome appliances.
3. Simplicity of adjustments.
4. Economy of use.

5. Adequacy as a retainer after tooth movements are completed.

"A removable retainer which allows a maximum of freedom to the denture, allowing it to function as much as is possible while under retentive restraint, is by far the best form of retention."[3]

After all tooth movements are complete, the patient is instructed to wear the retainer at all times for a period equivalent to that required for the treatment itself. The patient is then instructed to wear the retainer at night only. Spot grinding is a helpful procedure after the alignment of the teeth and arches is accomplished.

It is needless to say that in order to successfully accomplish results, there must be explicit instructions to the patient, such as:

1. The care of the appliances.
2. Proper oral hygiene.
3. Use of myofunctional therapy.
4. Proper articulation of speech.
5. The importance of wearing the appliances as instructed.

1 Nevins Street

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DISCUSSION

Dr. Raymond L. Webster.—I should like to ask the speaker if he has a great deal of difficulty with younger patients in the matter of cooperation. We have always had that in using this type of an appliance as a retainer, so we have been glad they did not have to wear it longer. Our speaker has given us a beautiful paper, with a simplified technique, and I know it must be practical or he would not have presented it, but does he have a great deal of difficulty in securing cooperation from his lively patients?

Dr. Stolzenberg.—I presume Dr. Webster means noncooperative patients. I will preface my remarks first by saying that I do not handle noncooperative patients. I would rather dismiss them at the beginning than have a headache and a bad result at the end. I put my foot down to begin with.

Now to answer the question specifically, most of these cases reported today, as you notice, were of younger children. The reason for using the younger patients in my paper was because I can show a better arrangement of functional occlusion and a complete dentition; whereas, with adults, we have missing teeth and sometimes badly deformed arches, which I don't think make for a good presentation. Most of these children ranged from 6 to 8 years of age. We get the cooperation of our patient to begin with, and after that it is easy. The best way of overcoming the difficulty in wearing these retainers is to put bands on the anchorage teeth; that is, the deciduous second molars, or the first molars should they be erupted. I put a band on with a buccal spur, so that the clasp snaps into position, and I usually have the clasp coming around from the posterior portion, running anteriorly with a little extension arm, so it is an easy thing for a child to slip his fingers into the oral vestibule and dislodge the appliance; ordinarily you will find that that helps in retention.

We usually find another obstacle, that is, with speech. We take some time out (if I have the time I will do it; if not, one of the girls in the office will do it) with a patient that has on an appliance for the first time, and we spend ten to fifteen minutes on articulation of speech and on the proper use of the appliance. I have found that to be very successful.

Editorial

A Radio Address

A radio address, prepared for laymen, by Kenneth A. Easlick, outstanding leader in public dental health of the University of Michigan, was published in the January issue of the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY. The address was read over station WSM Nashville, Tennessee, during the meeting of the Tennessee State Dental Association, and it has attracted considerable attention among orthodontists everywhere.

Subsequent to its publication in the JOURNAL, and on account of the unusual response made to it, the Editor was inspired to reread the contribution. A part of the reason for the interest of orthodontists, at least, may be contained in the fact that Dr. Easlick made the point that mothers are shocked, after following specific diets and other directions outlined by modern physicians and dentists, to find that their offspring still have decayed teeth. The author makes the observation that in such instances the mother tries her best to follow directions but is unable to do so because of a chain of circumstances that provide the child with an excess of sugar and refined carbohydrates. He points out that, with plenty of soft drinks, chewing gum, and some starches in the diet, sweets after all have not been eliminated sufficiently to have much effect on the child's teeth, and that such a diet is after all a far cry from that of the Eskimos of the interior of Alaska, who formerly had no sweets of any kind and were held up as an example of a primitive people with unusually fine teeth.

It would seem more reasonable to suppose, however, that perhaps the best explanation for the orthodontists' interest in the article may be gleaned from a "punch" paragraph in which is plainly reflected the theme, most interesting to the orthodontist, that the physiology of growth and nutrition is one of the most important single considerations in both orthodontic etiology and treatment. Dr. Easlick says, "Being a person who is expected to look after the mouth health of his patients primarily, I am still interested in the entire patient. If the entire child patient does not grow, his jaws may not become large enough for his permanent teeth and his teeth may not be nicely formed. Hence, I recognize a well-balanced, well-fortified diet for my patients: one sufficient in milk, eggs, butter, meat, colored vegetables, fresh fruits, whole-grain cereals, whole-grain bread, and cod-liver oil. I always add, however, 'Keep the sweets low to help prevent tooth decay.'"

Who is there of mature experience who has not observed, in clinical practice alone, that there are occasions when it is well worth while to remove all orthodontic appliances and to allow the patient a good healthy period of rest during an accelerated normal growth spurt?

As one voice of experience has aptly put it, "Blessed is he who can recognize the classical symptoms, when he sees them, of an orthodontic case overtreated and suffering from overmechanization, in which the growth processes have been greatly neutralized. Such cases are badly in need of a rest cure and, like other overworked tissue, need to get well."

In these days when such important scientific strides are being made in the chemistry of soils, much can be learned about growth from the soil experts.

They say that 95 per cent of the essentials of life come from air, water, and sunshine, which furnish the motivating energy forces, and that we are inclined to disregard the 5 per cent which comes from the soil and which is responsible for strong sturdy tissue. This 5 per cent contains twelve elements, anyone of which, if missing, prevents normal growth, according to these soil and nutrition experts.

It sometimes requires years of clinical orthodontic experience for one to grasp the idea that there is a "feel" or a "sixth sense" to correcting malocclusion, as there is a "feel" to hitting a golf ball or playing the piano, and that the quickest way for one to absorb that idea is to become growth-minded. Dr. Easlick pointed that out to laymen, and orthodontists obviously understood and agreed with the theme as a result of their long experience with a combination of mechanical and growth problems, both of which are important.

H. C. P.

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Max E. Ernst, Secretary, American Association of Orthodontists, 1250 Lowry Medical Arts Bldg., St. Paul, Minn.

In Memoriam

WARREN D. HAGGERTY

Dr. Haggerty was born in Sussex County, New Jersey, on Aug. 22, 1879, of English parentage. He received his early education in the public schools of that county. Later he entered the Baltimore College of Dental Surgery, and was graduated from that institution in 1901.

Upon graduation he began the practice of dentistry in Bangor, Pennsylvania, and the following year became located in Hackensack, New Jersey, where he soon established a large practice. In 1928 he abandoned this in order to devote himself to the exclusive practice of orthodontics in which he remained until about two years ago, when ill-health forced him to retire.

Dr. Haggerty was a member of the Oritani Field Club, the Elks, and the Hackensack Golf Club.

He was active in organized dentistry, being one of the organizers and a charter member of the Bergen County Dental Society, and its first secretary. He was a member of the New Jersey State Dental Society and the American Dental Association, as well as a member of the New York Society of Orthodontists.

He is survived by his wife, Mrs. Edna Jones Haggerty, and two children, Mrs. Calthrop Bump and Lieut. Warren D. Haggerty of the Dental Corps of the United States Army.

As a fitting testimonial, the Committee on Necrology of the New York Society of Orthodontists submits the following resolution:

WHEREAS, an all-merciful and an all-loving Father has called from our fellowship Warren D. Haggerty, be it therefore

RESOLVED, that in recognition of his valuable services which are of enduring benefit to humanity, this Society desires to record its appreciation of his worth, its acknowledgment of the esteem and affection in which he was held, and to express the heartfelt sympathy of the members of this Society, with the bereaved family, in a mutual and irreparable loss; and be it further

RESOLVED, that a copy of these resolutions be spread upon the minutes of the Society as a permanent memorial, and a copy be sent to the bereaved family.

Ralph W. Waldron.

Department of Orthodontic Abstracts and Reviews

Edited by

Dr. J. A. Salzmann, New York City

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmann, 654 Madison Avenue, New York City

Treatment of the Lip and Cheek in Cases of Facial Paralysis: By A. A. Dahlberg, D.D.S., Chicago, Attending Dental Surgeon, Chicago Memorial Hospital, *J. A. M. A.* **124**: 503-504, Feb. 19, 1944.

A new simple method of supporting the lip and cheek in cases of Bell's palsy or facial paralysis has been found to be successful in preventing the droop and loss of tone that is so characteristic of these tissues in facial paralysis.

This method consists in cradling the lip and cheek in a translucent plastic support, and connecting that support by rubber band tension to a metal hook that is fastened to the last upper molar on the affected side (Fig. 1).

The lip support or cradle (*AB*) is the part that actually lifts the lip and cheek under tension from the rubber band. It consists of two flanges and a connecting bar that is shaped to conform to the closed lips (Fig. 2). The flanges should be large enough to keep the tissues from bunching at the angle of the mouth.

Pink base-plate wax is used to model the lip support. Care should be taken to keep the flanges from spreading away from each other under tissue pressure while it is being fitted. The wax model can then be reproduced in a translucent acrylic resin which is not at all unsightly or conspicuous. It is also light in weight, not irritating to the tissues, easy to keep clean, and easily processed.

The band (*C*) around the molar is constructed similarly to the bands used in orthodontic appliances or in gold crowns except that it is never necessary to cut into the tooth. If the contact between the last two teeth is close, a 26 gauge wire is used interproximally for separation. Gold of 22 karat and 30 gauge is used for the band. To this is soldered the hook (*D*), which is contoured of half-round 17 gauge dental clasp wire. The positioning and soldering of the hook is done best on a model made of a heat-resisting material such as is used in ordinary dental soldering techniques. The hook should be placed as high in the vestibule of the mouth as is consistent with the activity of the surrounding tissues. It should also be adapted close to the alveolar process above and posterior to the tooth.

The band (*C*) should then be placed on the tooth in the mouth for trial, and adjustments made to the hook (*D*) so that the proper direction of pull on the lip is obtained. The direction of pull should be up and back and is governed by the amount of lip droop, the length and anatomic conformation of the lip, the amount of fat tissue present, and the restriction of the surrounding tissues. The band may then be cemented in place.

Several holes for rubber band attachment are drilled in the inner flange of the lip cradle, as can be seen in the illustration. A small rubber band (*E*) is fastened to the flange by looping one end of the rubber band through a hole and then back through the other end of itself. It is generally an easy matter for the patient to stretch the free loop end of the rubber band over the end of

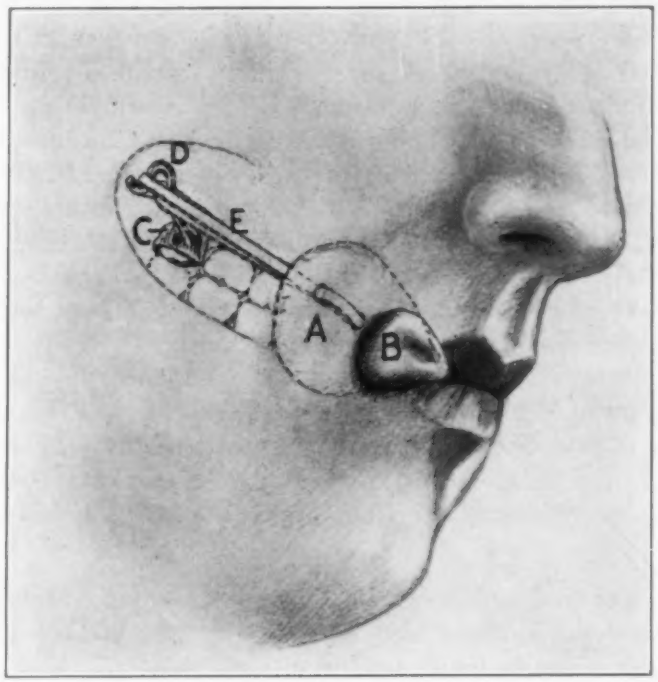

Fig. 1.—Diagrammatic view of appliances for supporting the lip and cheek. *A* is the flange of the cradle inside the cheek and *B* the outer flange. This pulls the lip under the traction from the rubber band, *E*, which is attached to the hook, D, on the gold band, *C*.

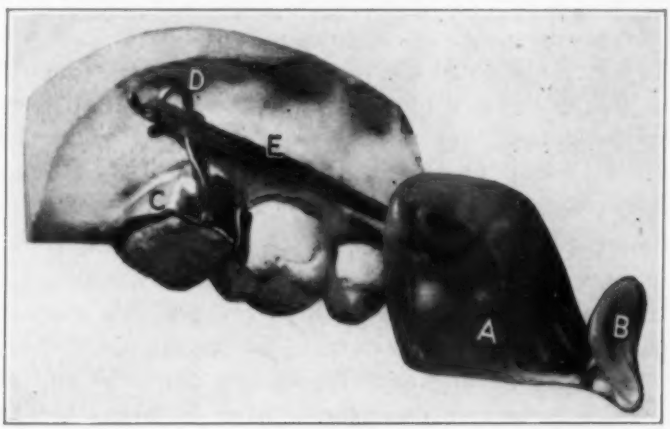

Fig. 2.—Plastic lip cradle (*AB*) rubber band (*E*), hook (*D*) and band (*C*) on a plaster cast of the maxillary teeth.

the forefinger and pass it back over the hook while holding the lip cradle in the palm of the hand. The cradle can easily be placed in position at the angle of the mouth. Experiment will determine the tension and size of the rubber band to be used and the holes in the appliance which are the most effective for fastening the bands.

Preparation of the tooth and the metal band to which the hook is soldered should be preceded by dental x-ray and clinical examination. If the alveolar bone about the tooth in question has receded very much, it is better to consider the possibilities of the next tooth forward. The difficulty with using a tooth too far anterior is that enough distance for adequate tension of the rubber band is not always obtained. Carious areas in the tooth should of course be filled, and calcareous deposits should be removed.

This method of lip and cheek support offers several advantages over other methods. It eliminates the conspicuousness which is so striking when adhesive tape or ear attachments and vulcanite are used. The translucent cradle is not very noticeable. The discomfort of traction over an ear and the messiness of adhesive tape are done away with. The device, once established, is easy to apply and use. It also gives better control of the tissues than do the other methods. Most important of all, the patient will use this appliance consistently at all times, whereas he did not do so with the others. Use of the device should be maintained until normal muscle function returns.

Bilateral Congenital Mucous Cysts in Three Generations. Three Generations of Mucous Cysts Occurring With Harelip and Cleft Palate: By Claire LeRoy Straith, M.D., D.D.S., Detroit, and Lieutenant Henry S. Patton, Medical Corps, Army of the United States, *J. A. M. A.* **123**: 693-694, Nov. 13, 1943.

A family was observed in which, through three generations, there was a tendency to bilateral harelips, and also hypertrophy of mucous cysts in the lower lip of each individual with harelip or cleft palate.

In this family of thirteen persons, there were, in three generations, six persons with bilateral harelips. Some of these patients had an associated cleft palate and each had a pair of hypertrophied mucous glands on the lower lip. These glands secrete a tenacious mucous material from two very prominent excretory ducts which open just above the mucocutaneous line of the lower lip. They are 1 cm. apart and are placed in the center of the lower lip. On the mucous membrane surface they appear to be blue and about the shape of an almond pit. In the adult they measure 2 by 0.5 cm. These glands have been described as mucoceles, retention cysts, or congenital fistulas.

Brophy quoted Sir Arthur Keith's belief that these cysts might be a reversion to a certain species of shark in which such glands occurred. In reviewing the literature and checking with two responsible sources, we can find no such evidence in the Elasmobranchs. As certain amphibians assume the terrestrial life, lateral line organs sink beneath the skin and atrophy. This might be an analogue to this condition. Also, in fishes the hyomandibular line forms two anterior pores in the lower lip posterior to the symphysis, and may be a zoological ancestor to this deformity.

In human embryology no clear explanation is to be found for the uniformity and size of these cysts. We do know that mucous cysts occur abundantly in this region and that hypertrophy of the lower lip occurs routinely when there is lack of pressure from opposing tissue, as in harelip. Also, we have observed these glands and lip decrease in size after surgical repair of the

harelip. We cannot, however, explain to our satisfaction the occurrence of two symmetrical glands when many other such glands are in the vicinity. The occurrence must follow mendelian laws in these cases and the glands must have some analogue other than the numerous small mucous cysts found in this region.

The father had a double harelip, cleft palate, and mucous cysts. The mother of the second generation had a congenital syphilitic perforation of the hard palate. This was untreated when her first two harelip children were born.

This infection was then treated and her Wassermann reaction was negative when the next two harelip children arrived. None of these children have congenital syphilis today. The mother's sisters, however, are under treatment for congenital syphilitic lesions. We do not feel that this disease influenced the frequency of deformities in her offspring. This same mother's syphilitic palate lesion came on spontaneously and healed under antisyphilitic therapy.

We have found that simple excision of the gland and some tissue reduces the size of the lip and eradicates the glands. Of course, no glandular tissue should be left, for fear of recurrence.

J. A. S.

News and Notes

Excerpts From the Bulletin of the Pacific Coast Society of Orthodontists

NORTHERN SECTION

Northern Section of the Pacific Coast Society of Orthodontists meets on the second Tuesday of March, June, September, and December.

The Northern Section of the Pacific Coast Society of Orthodontists held its first evening meeting of the year at the Washington Athletic Club in Seattle, on Monday, Jan. 10, 1944. There was considerable discussion in regard to holding a meeting in the summer. So much favorable comment has come from the last meeting in Victoria that all would like to hold a similar session.

Therefore, plans are being made for an all-day meeting in Seattle, in June. According to Chairman Bishop, Drs. Emery Fraser, Milton Fisher, and Donald MacEwan are on the program committee. With this talent there should be a very worth-while meeting.

Dr. Fisher spoke at some length on the presentation of orthodontic cases. True profiles and front views, together with x-rays and models, before and after treatment, will make complete records and all can see what has been done.

Dr. MacEwan gave a paper on cementation, which included the following interesting items:

1. Cement maintains the band on the tooth and prevents decay and decalcification.
2. The cement line should show and be seen occlusally and gingivally.
3. The durability of the cement depends upon the manufacture and upon personal observation and experience.
4. No occlusal burnishing should be done on premolars or molars.
5. Since the manufacturers are not equipped with hot and cold saliva, laboratory tests will be inconclusive.
6. Cement holds up better in some mouths than in others, and bands should be recemented according to each case.

Following the paper, Dr. MacEwan gave a practical demonstration of cement mixing.

CENTRAL SECTION

The Central Section of the Pacific Coast Society of Orthodontists meets on the second Tuesday of March, June, September, and December.

The meeting of the Central Section of the Pacific Coast Society of Orthodontists was held March 13, 1944, at the Alexander Hotel, San Francisco.

Dr. William W. Leslie admitted that the report that he is to retire from active practice is correct, but that it is not from choice. Dr. Leslie, at that time, took the opportunity to introduce Dr. Fred E. Havrilla, his associate, who will carry on with the office practice.

The American Red Cross presented a sound movie showing the activities of the Red Cross afield, which was well received.

Dr. Thomas Sweet reported that Dr. J. Camp Dean, President of the Pacific Coast Society of Orthodontists had talked of the anticipated trip to the Pacific Coast of Dr. B. Holly Broadbent.

Dr. A. F. Skaife, Program Chairman, introduced the speaker of the evening, Dr. Charles A. Sweet, of Oakland, whose presentation was titled, "A Children's Dentist Looks to the Future of the Orthodontic Problem."

Dr. Sweet observed that children's dentistry is the one part of dentistry that has stood up in the past several years in postgraduate study. There have been spurts and starts in other branches of dentistry, but particularly in Michigan, Nebraska, and California, intensive courses in children's dentistry are continuing year after year. In his own practice about one-third of his child patients are in need of orthodontic interference. He feels that the

dentist in general practice should know more of growth and development of the teeth and jaws, as many incipient abnormalities of tooth position can be diagnosed by the general practitioner of dentistry, and the individual tooth or teeth guided into their proper position by simple procedures. Dr. Sweet suggests that, as orthodontists, we are not sufficiently intent in the study of preventive orthodontics, but hastens to add that orthodontists are not entirely at fault, because practically the only cases we see are orthodontic cases. The burden of observation rests on the shoulders of the dentist and the physician who see children but do not observe slight anomalies which terminate in malocclusion. Dr. Sweet feels that every child should be in the dentist's office at 2 years of age, and at 5 years of age a full mouth x-ray should be routine. He states that much can be learned at this age and he feels that he can predict certain abnormal conditions that are developing. From this diagnosis he feels that tooth guidance properly followed can prevent some malocclusion and will provide the dentist with material for the logical care and operation of preventive measures. Dr. Sweet then presented more than three hundred kodachrome slides, showing his work in operative dentistry for children, ectopic eruptions, tooth guidance with metallic inclined planes, the "hay rake" device for tongue-thrusters and thumb-suckers, and many other features, all taken from his own practice.

Dr. Wylie sketched the background of Dr. B. Holly Broadbent and his work with the cephalometer, and announced that the University of California College of Dentistry is about to install one of the instruments. He stated that the actual instrument is at present set up and in operation in the office of Dr. Broadbent, and that in the near future Dr. Broadbent will come to California to install the cephalometer and will appear before the groups.

SOUTHERN SECTION

The Southern Section of the Pacific Coast Society of Orthodontists meets on the second Friday of March, June, September, and December.

The Southern Section of the Pacific Coast Society of Orthodontists held its meeting March 24, 1944. The meeting was originally scheduled to include an illustrated paper by Dr. Oppenheim, entitled "A Possibility for Physiologic Tooth Movement," but because of illness Dr. Oppenheim was unable to appear, and Dr. Spencer Atkinson spoke on the most interesting subject. "The Etiology of Malocclusion."

Dr. Oppenheim will present his paper at the next meeting. We are informed that he has some revolutionary ideas to present and feel that it should invoke a great deal of interest, particularly since the trend is away from the idea of complicated mechanisms to accomplish tooth movement.

An unusual presentation last December was that of Dr. Walter Furie. To supplement his paper on the many unique and original ideas he employes, he provided each member with a blueprint, beautifully developed, to show in detail his various gadgets.

Another rather unusual meeting everyone enjoyed last year was Dr. Hays Nance's discussion of Dr. Dallas McCauley's paper, presented at a previous meeting. Instead of merely quoting a few sections of Dr. McCauley's paper, every member was provided with a complete edition with the request that he come prepared to discuss the various phases of this important subject, "The Role the Cuspid Plays in Retention."

Institute on Dental Health Economics
University of Michigan

The School of Public Health of the University of Michigan announces plans for an Institute on Dental Health Economics to be held at Ann Arbor throughout the week of June 26 to July 1.

It is the purpose of this Institute to bring together a group of outstanding leaders in the field of dental health under the chairmanship of Dr. Kenneth A. Easlick, Associate Professor of Public Health Dentistry, in order that they may share their experiences and pool their thoughts on the improvement of the dental health of the American people. It is the plan of the Institute to review briefly the social and economic background of health

problems, and against this setting to develop a comprehensive understanding of the dental problem. Minimum standards of dental health service will be considered, and concise information will be presented to assist in the development of a program to solve the dental problem at this level of standards. It is intended that the work of the Institute will culminate, therefore, in concrete proposals for a dental health program designed to meet the challenging needs which are known to exist.

The Institute will be of particular interest to officers and committee members of the American Dental Association and component societies, to representatives of both governmental and nongovernmental agencies which are participating in dental programs, to the faculties of dental schools, and to many private practitioners. Because of the nature and purpose of the Institute, registration must be limited to fifty members. Although an attempt will be made to obtain a geographic distribution of the applicants, primary consideration will be given to the order in which applications are received. Requests for application blanks should be sent promptly to Dr. Kenneth A. Easlick, School of Public Health, Ann Arbor, Michigan.

Roentgenographic Study of the Teeth of a Group of Dentists

Does the dentist see his dentist at regular intervals?

The April issue of the *Journal of the American Dental Association* reveals, in an article dealing with a roentgenographic (x-ray) study of the teeth of a group of 350 dentists of the State of Tennessee, that "the mouths of the dentists under study were in need of considerable restorative work."

George Ballard Diefenbach, B.S., D.D.S., and Harold Allen Eskew, A.B., D.M.D., from the Department of Pathology and Diagnosis of the University of Louisville, School of Dentistry, Louisville, Kentucky, made the study of x-rays taken during the course of the second annual postgraduate seminar given by the Tennessee State Dental Association, in November, 1940. The 350 dentists were from all parts of the state and their ages ranged from 21 to 65 years. From the entire group of 350 full-mouth x-rays, 102 were selected as being satisfactory for this study.

According to the data derived from this x-ray study of the teeth of 102 dentists, the number of missing teeth per mouth was 5.3. Metallic restorations (fillings) per mouth were 10.9, and metallic restorations with defective margins were 1.4 per mouth. Primary caries (decay affecting tooth enamel) averaged 1.8 per mouth, and secondary caries (decay affecting both enamel and tissue beneath the enamel) were 0.39 per mouth.

In addition to the conclusion drawn from the study that there was a definite need for restorative work in the mouths of the dentists, the article stated that "prevention of pathologic (diseased) conditions such as aveolar atrophy (tooth-socket shrinkage) is needed."

Tales From Ivory Towers*

Tales From Ivory Towers is a series of thirteen fifteen-minute radio programs in electrical transcription form.

Each broadcast consists of an episode, dramatically presented, from a great book that all children love. Inserted in each broadcast are two terse dental health messages tuned to the spirit of the story.

Educators believe that the two greatest things which can be given children during their elementary school years are the ability to read well and a love of good books. Dentists know how important it is that children learn the value of mouth health during their elementary school years. Therefore, in preparing this radio material, the Bureau has endeavored to interest children in good literature as well as in mouth health.

Tales From Ivory Towers offers dental societies and boards of education an opportunity to present a joint radio program that is unique, interesting and educational.

Tales From Ivory Towers gives dentistry an opportunity to aid educators in their efforts to interest children in better literature and, at the same time, interest both parents and children in better dental health.

*Thirteen radio programs by the Bureau of Public Relations, American Dental Association, 222 E. Superior St., Chicago 11, Ill. Further information may be secured by writing direct to the above.

Meetings of American Association of Orthodontists

Year	*Presidents*	*Secretaries*	*Places of Meeting*
1901	†Edward H. Angle	Milton T. Watson	St. Louis
1902	†Edward H. Angle	Milton T. Watson	Philadelphia
1903	†Milton T. Watson	Anna Hopkins	Buffalo
1904	Lloyd S. Lourie	Anna Hopkins	St. Louis (Int'l Dental Cong.)
1905	Lloyd S. Lourie	Anna Hopkins	Chicago
1906	†R. Ottolengui	Frederick S. McKay	New York
1907	†Herbert A. Pullen	Frederick S. McKay	Detroit
1908	†Charles A. Hawley	Frederick S. McKay	Washington
1909	Frank M. Casto	F. C. Kemple	Cleveland
1910	†B. Frank Gray	F. C. Kemple	Denver
1911	Alfred P. Rogers	F. C. Kemple	Boston
1912	†Milton T. Watson	F. C. Kemple	Chicago
1913	B. E. Lischer	F. C. Kemple	Chicago
1914	†Guy B. Hume	W. E. Walker	Toronto
1915	†Frederick C. Kemple	W. E. Walker	San Francisco (Int'l Dental Cong.)
1916	†Frederick C. Kemple	F. M. Casto	Pittsburgh
1917	M. N. Federspiel	F. M. Casto	Excelsior Springs
1918	D. Willard Flint	F. M. Casto	Chicago
1919	O. W. White	F. M. Casto	St. Louis
1920	John V. Mershon	F. M. Casto	Chicago
1921	†J. Lowe Young	Ralph Waldron	Atlantic City
1922	†Martin Dewey	Ralph Waldron	Chicago
1923	Burt Abell	W. H. Ellis	Chicago
1924	Ralph Waldron	W. H. Ellis	Kansas City
1925	Clinton C. Howard	W. H. Ellis	Atlanta
1926	†William C. Fisher	W. H. Ellis	New York (First Int'l Ortho. Cong.)
1927	Joseph D. Eby	Charles R. Baker	Chicago
1928	Walter H. Ellis	Charles R. Baker	Buffalo
1929	†Albert H. Ketcham	Charles R. Baker	Estes Park
1930	Oren A. Oliver	Charles R. Baker	Nashville
1931	Harry E. Kelsey	Claude R. Wood	St. Louis
1932	Charles R. Baker	Claude R. Wood	Toronto
1933	W. E. Flesher	Claude R. Wood	Oklahoma City
1935	L. M. Waugh	Claude R. Wood	New York
1936	H. C. Pollock	Claude R. Wood	St. Louis
1937	P. G. Spencer	Claude R. Wood	Chicago
1938	James D. McCoy	Claude R. Wood	Los Angeles
1939	†Harry A. Allshouse, Jr.	Claude R. Wood	Kansas City
1940	William A. Murray	Claude R. Wood	Chicago
1941	Henry U. Barber, Jr.	Max E. Ernst	New York
1942	Claude R. Wood	Max E. Ernst	New Orleans (Inter-American Ortho. Cong.)
1944	James A. Burrill	Max E. Ernst	Chicago

New York Society of Orthodontists

The fall meeting of the New York Society of Orthodontists will be held at the Waldorf-Astoria Hotel, New York City, on Monday and Tuesday, Nov. 13 and 14, 1944.

Dental Health for School Children

According to Dr. J. A. Salzmann and Dr. Leon R. Kramer in the *American Journal of Public Health* for February, "In order to prevent the repetition of dental neglect of school children, the U. S. Office of Education, the U. S. Public Health Service, and the American Dental Association, have united their efforts in sponsoring a nationwide dental program designed to reduce this health hazard among high school boys and girls, especially those in the upper grades, most of whom are shortly to enter the armed forces or war industries.

†Deceased.

It is hoped that these boys and girls will be made dentally fit before they actually leave school. This program which has already been launched is correlated with the correction of physical defects phases of the Victory Corps and Physical Fitness programs operating in high schools throughout the nation. It is planned to continue the program for the duration.

"The coordination, implementation, and execution of the program on the national level has been delegated to the Victory Corps-Physical Fitness Dental Program Committee of the American Dental Association, which is composed of representatives of national dental, educational, and health groups. This committee of which Dr. Leon R. Kramer of Topeka, Kansas, is chairman, is supported and assisted by the Council on Dental Health of the American Dental Association, headed by Dr. Emory Morris of Battle Creek, Mich.

"Letters explaining the program have been mailed from the U. S. Office of Education, in September of this year, to all state superintendents of public instruction, who are requested in turn to inform all high school principals in the nation.

"Reports from dental officials indicate that approximately 40 states and the District of Columbia are now participating in the Victory Corps-Physical Fitness Dental Program which is designed to function under either the Victory Corps or other types of physical fitness programs operating in high schools in this country.

"The Council on Dental Health has urged dental and school officials in every state to make some provision to carry out the intent of the program."

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Secretary-Treasurer, Max E. Ernst - - - 1250 Lowry Medical Arts Bldg., St. Paul, Minn.
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*The Journal will make changes or additions to the above list when notified by the secretary-treasurer of the various societies. In the event societies desire more complete publication of the names of officers, this will be done upon receipt of the names from the secretary-treasurer.

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Treasurer, Pedro Gandulfo - - - - - - - - - - - - - - - Calle Londres 63

Sociedad Argentina de Ortodoncia

Director, Raul Otano Antier
Secretary, Miguel A. Finocchietti
Secretary-Administrator, Edmundo G. Locci

*The Journal will publish the names of the president and secretary-treasurer of foreign orthodontic societies if the information is sent direct to the editor, 8022 Forsythe, St. Louis 5, Mo., U. S. A.

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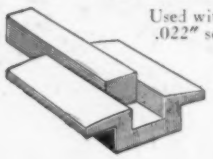
S. S. White New Orthodontic Appliances

BRACKETS NOS. M 464 and M 465

A modification of the Dr. E. H. Angle Edgewise Arch Bracket for use with other types of arches, made in response to requests for a bracket of this type and after a suggestion by Dr. A. F. Jackson. These brackets are about half the height (consequently project less) and are considerably longer than the Edgewise Arch Bracket.

The slot, or channel, for the arch wire is not held to the close manufacturing tolerances found in the Edgewise Arch Bracket.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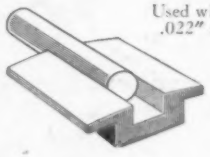
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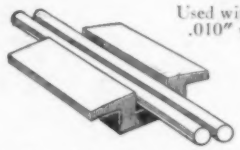
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M 496X	(M464 on seamless band No. 170)	6.10	56.00
*M 497X	(M465 on seamless band No. 170)	6.10	56.00

*Available on special order. †M452 is Dr. E. H. Angle Edgewise Arch Bracket.

HALF-ROUND TUBES (All-precious metal)

Order No.		Pkg. of 10	5 Pkgs. of 10	10 Pkgs. of 10
M 62 M 63 M 64	.08″ long .09″ long .10″ long } For 14 gauge ½ Round Wire	$2.50	$11.50	$20.00
		1 Doz.	5 Doz.	10 Doz.
M 62 M 63 M 64	} 1 dozen fitted on 2″ length shafting	$4.50	$21.25	$38.00

Important: It is recommended that all half-round tubes be purchased fitted to the shafting to assure proper fit. They will be so supplied unless otherwise designated.

BUCCAL TUBES (All-precious metal)

Order No.		Pkg. of 10	5 Pkgs. of 10	10 Pkgs. of 10
M 37 M 39 M 41	.25″ long for .036″ wire .25″ long for .038″ wire .25″ long for .040″ wire	$3.00	$14.50	$28.00

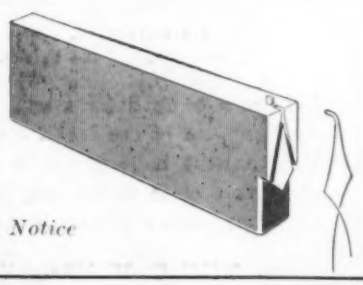
SEAMLESS ANTERIOR BANDS (All-precious metal)

Order No.		Pkg. of 10	Pkg. of 100
M 170	Seamless 3/32″	$4.40	$40.50
M 171	Seamless ⅛″	4.50	42.00

LIGATURE FORMER

For preforming ligature wire .007″ to .010″ for use with Brackets M 464, M 465, and the Edgewise Arch Bracket.

$1.00 each



Prices Subject to Change Without Notice

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